

Museum Rusticum et Commerciale :

O R,

SELECT PAPERS

O N

AGRICULTURE, || ARTS, AND
COMMERCE, || MANUFACTURES.

DRAWN FROM EXPERIENCE,

A N D

Communicated by GENTLEMEN engaged in
these Pursuits.

Revised and Digested by several MEMBERS of the SOCIETY for the
Encouragement of ARTS, MANUFACTURES, and COMMERCE.

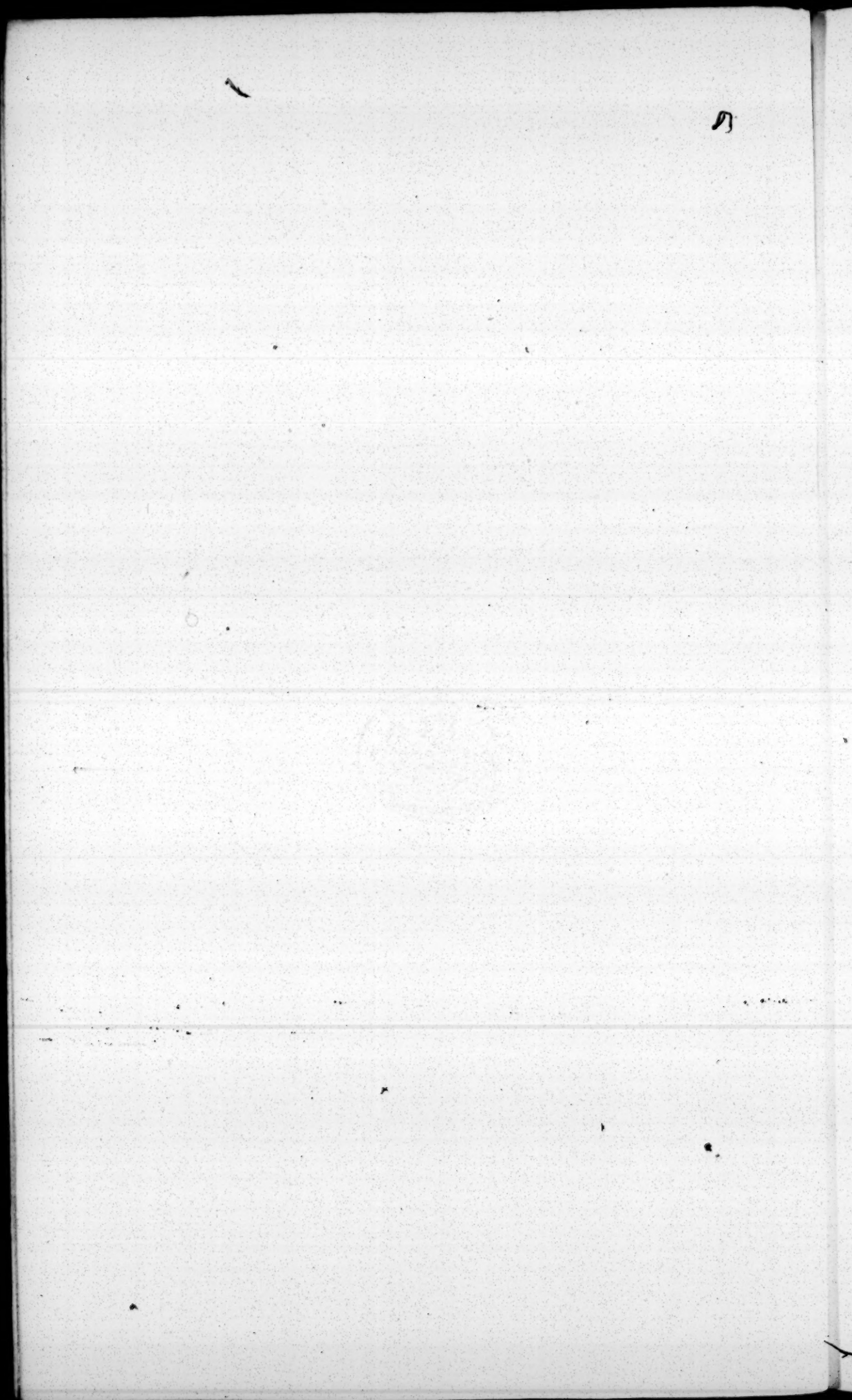
VOLUME THE FIFTH.

Hæ tibi erunt Artes.

L O N D O N :

Printed for R. DAVIS, in Piccadilly ; J. NEWBERRY, in St. Paul's
Church-Yard ; and L. DAVIS and C. REYMERS, in Holborn.

MDCCCLXV.



CONTENTS.

NUMBER I.

- A** *N Account of two Acres of Burnet sown in September last, Broad-Cast, on a light poor Soil, that had borne two Crops of Corn, namely, Barley and Wheat* Page **I**

NUMBER II.

- A Letter from the Old Essex Farmer, containing an Account of an Experiment of sowing and transplanting Burnet, with other useful Observations* **4**

NUMBER III.

- The Old Essex Farmer's Method of planting Elm-trees* **10**

NUMBER IV.

- A Letter to the Dublin Society, from Sir James Caldwell, Baronet, Fellow of the Royal Society; giving an Account of the Culture and Quality of several Kinds of Grass lately discovered* **13**

NUMBER V.

- An Account of the Culture of Carrots, and their great Use in Feeding and Fattening Cattle, as practised by Mr. Robert Billing, Farmer, at Weasenham All-Saints, Norfolk* **22**

NUMBER VI.

- An Account of the Soil, Culture, Time of taking up, Produce and Effects of Twenty-four Acres and a Half of Carrots, for which Mr. Billing's Certificate was granted in the Year 1764* **34**

NUMBER VII.

- The Efficacy of Mr. Rocque's Method of cleaning Lucerne with Harrows, demonstrated* **37**

NUMBER VIII.

- A remarkable Experiment relative to Grasses, lately made by Mr. Rocque* **39**

NUMBER IX.

- On the Burnet, Timothy-Grass, Bird-Grass, and Orchard-Grass, with Specimens of each* **42**

NUMBER X.

- On Cone, or Blue-Ball, Wheat.* **46**

N U M B E R X I.

Reflections on the Tendency and Consistency of some late Letters to the Editors of the Museum Rusticum, &c. Page 47

N U M B E R X I I.

Of the Nature of the Burnet cultivated by Mr. Rocque 57

N U M B E R X I I I.

Some further Observations on the various Species of Burnet, and other Grasses, especially Saintfoin and the Carexes; and Cautions about Sowing and Transplanting of Lucerne 61

N U M B E R X I V.

On the Means of propagating the separate Culture of our Native Grasses 67

N U M B E R X V.

On the Method of curing luxuriant Apple-Trees; with some Remarks on the Culture of Bere 68

N U M B E R X V I.

On the fatal Effects of Ground-Ivy, when eaten by Horses 71

N U M B E R X V I I.

On the Culture and amazing Produce of the African Millet 74

N U M B E R X V I I I.

Some Remarks, by the Editors 77

N U M B E R X I X.

A Letter from the Old Essex Farmer, in which he gives his Opinion relative to the Education of a Youth intended for a Farmer 81

N U M B E R X X.

Premiums offered by the Society for the Encouragement of Arts, Manufactures, and Commerce 90

N U M B E R X X I.

Premiums offered by the Society,—FOR FISHERIES 102

N U M B E R X X I I.

An improved Way of procuring good and clean Wheat Crops 104

N U M B E R X X I I I.

A Proposal for the Increase of Apiaries in Ireland, addressed to the Dublin Society, by Sir James Caldwell, Bart. Fellow of the Royal Society 110

N U M B E R X X I V.

Observations on the Growth and Destruction of Seagrass, or Rag-Wort 117

N U M B E R X X V.

Of Housing great Cattle 125

C O N T E N T S.

N U M B E R XXVI.

A Letter from James Crokatt, Esq; to the Editors Page 133

N U M B E R XXVII.

*A Letter from John Lewis, Esq; to James Crokatt, Esq;
relative to the Culture of the Burnet-Grass* 134

N U M B E R XXVIII.

*An Account of the Prices of Wheat, and some other Articles of
necessary Provisions, at various distant Periods of Time;
with some reasonable Deductions therefrom* 137

N U M B E R XXIX.

*An easy Method of building Chimneys that will not smoke,
pointed out* 149

N U M B E R XXX.

*On the Advantages of ascertaining the mean Weight of various
Kinds of Grain* 151

N U M B E R XXXI.

On the Winter-Management of Meadows and Grass-Grounds 154

N U M B E R XXXII.

An Account of some Burnet sown on a poor sandy Soil 157

N U M B E R XXXIII.

On the Qualities of Sea-Salt, with respect to Vegetation 159

N U M B E R XXXIV.

*On the separate Culture of Grasses, and the Improvement of
Grass-Grounds* 161

N U M B E R XXXV.

Mr. Stillingfleet's Opinion, relative to the best English Grasses 173

N U M B E R XXXVI.

*Reflections on the last Section of Dr. Home's Principles of
Agriculture and Vegetation* 181

N U M B E R XXXVII.

On Mr. Rocque's Grasses 186

N U M B E R XXXVIII.

*Some Experiments made by the Old-Fashioned Farmer in the
Culture of Burnet, Lucerne, Saintfoin, &c.* 189

N U M B E R XXXIX.

*Mago's Advice relative to the Management of Mr. Scott's
Common-Field* 195

N U M B E R XL.

*A Proposal for encreasing the Quantity of Fodder and Manure
by Suppression of a reigning Evil* 200

N U M -

N U M B E R XLI.

Of a Reform in covering of Farm-Houses, &c. Page 204

N U M B E R XLII.

Of the Cutting-Box, with proposed Improvements 208

N U M B E R XLIII.

Of the Uses of Furze, and the Impropriety of cultivating it in England 213

N U M B E R XLIV.

On curing Cattle hoed by eating Clover 218

N U M B E R XLV.

An Essay on Timber-Trees.—Written in the Year of our Lord, 1645, by Mr. Jo. Hall, of Skidley, in Yorkshire; and revised, corrected, and transcribed, in the Year of our Lord, 1765, by Thomas Comber, of East-Newton, in Yorkshire 226

N U M B E R XLVII.

On the Differences betwixt the Burnets now cultivated in various Parts of the Kingdom 237

N U M B E R XLVIII.

Benefit of harrowing a foul Crop of Turneps 239

N U M B E R XLIX.

An Acknowledgment of the Efficacy of a Receipt, published in the Museum Rusticum, for curing the Scab and Fly in Sheep 240

N U M B E R L.

Observations on the Importance of Agriculture to Great-Britain; and the Means of promoting the Improvement of it at present, in a Letter to the Editors 241

N U M B E R LI.

A Letter from the Rev. Mr. Comber, to the Editors, including also another from him to J. Cooke, Esq; both containing an Account of some Experiments, which seem unfavourable to the Opinion, that the Culture of Burnet may be useful and profitable 250

N U M B E R LII.

An Account of several very important Experiments made by Mr. John-Wynn Baker, under the Direction of the Dublin Society, and published at their Request, on the Culture of Cabbages, the Turnep-Cabbage, Boorcole, and Turneps, by various Methods; with an accurate State of the Produce, and

C O N T E N T S.

vii

and of the absolute and comparative Advantages of each in feeding Sheep and horned Cattle Page 257

N U M B E R LIII.

Queries, Experiments, and Remarks, concerning Lucerne, Burnet, and some other Articles of Husbandry; in a Letter from James Crockatt, Esq; to the Editors; and in three others to him from Mr. Lewis, Mr. ———, and Mr. ——— 281

N U M B E R LIV.

Queries relative to some particular Land, with respect to Manure, Number and Kind of Crops, and the laying it down in Grass 289

N U M B E R LV.

Further Reflections on different Accounts of the Success of the Culture of Burnet, with Answers to Queries relative to that Plant 293

N U M B E R LVI.

A List of the most remarkable Weeds, which infest the Arable and Grass Lands in England, ranged according to their Duration; with the Times of their Flowering; and Hints on the best Means of extirpating some of them 301

N U M B E R LVII.

Experiments and Observations on the Sowing of Horse-Beans together with Oats 309

N U M B E R LVIII.

Observations on Turf-Ashes; and on the Question, Whether it is best or not to lay Ground bare in Winter, by cutting off such Grass as is not eaten in Autumn? 310

N U M B E R LIX.

The Plantation of the Great Maple recommended (commonly called the Sycamore) 318

N U M B E R LX.

Continuation of Mr. John-Wynne Baker's Report to the DUBLIN SOCIETY: Containing Experiments and Observations on the comparative Ripening of Spring and Common Wheat; the comparative Advantage of sowing Barley in the Broad-cast or Drill Ways; French Barley; Burnet; Lucerne; Red Clover; the native Strawberry Trefoil; and the Means of killing the Red-Worm, which frequently destroys young Corn 321

N U M-

N U M B E R LXI.

*Comparative Reflexions on the different Methods of cultivating
Lucerne* Page 350

*Occasional Reflexions on the Profit of a Dairy, compared with
those of Tillage* 355

N U M B E R LXII.

*Continuation of the comparative Reflexions on the different Me-
thods of cultivating Lucerne* 359

N U M B E R LXIII.

Account of a proposed Improvement of the Manure-plough 363

N U M B E R LXIV.

*Experiments and Observations on the Means of preventing the
Smut in Corn: With an Inquiry into the Cause of it* 368

N U M B E R LXV.

*Observations on the Structure and Utility of the Spiky Roller,
intended to break, and lay fine, stiff and clotted Ground:
With additional Remarks relative to the Use and Advantages
of this Instrument* 372

N U M B E R LXVI.

A Letter respecting the making Pot-ashes in Great-Britain 381

N U M B E R LXVII.

*Observations on the Value of Manors and Estates let on long Leases
determinable on Lives; demonstrating some material Errors in
the Rates, according to which they are at present sold* 383

N U M B E R LXVIII.

*Observations on a Premium offered by the Society for the Encou-
ragement of Arts, &c. for a Machine to slice Turneps for
feeding Cattle* 386

N U M B E R LXIX.

*Letter to the Editors, containing some general Remarks on the
Contents of the Museum Rusticum; with an Answer to
them from the Editors* 392

Museum Rusticum, &c.

For JULY, 1765.

VOLUME the FIFTH.

NUMBER I.

An Account of two Acres of Burnet sown in September last, broad-cast, on a light poor Soil, that had borne two Crops of Corn, namely, Barley and Wheat.

GENTLEMEN,

A GREEABLE to my promise, I now send you an account of my two acres of burnet*.

You may probably be much surpris'd when I tell you it was sown the middle of last September, broad-cast, on a piece of ground that had produced wheat, with only ploughing once after the stubble was mowed. But I am to observe, that the year before it was barley, and that I had well manured it with lime and coal-ashes†, and

* See Numbers XXXII. and LVIII. of Vol. IV.

† Are coal-ashes a good manure for light land? That they are so for a stiff clay, is a known truth; therefore, if they should be suited to light soils also, it would be a great acquisition in husbandry, as the quantity made of this manure is annually en-
Vol. V. No. 23. B creasing

and reduced it, by frequent ploughings and harrowing, to a fine powder.

I am now to give you my reasons for so doing : First, I had determined to lay down this year several acres of this light land with durable seeds, and therefore fixed on burnet for one ; and as this piece was clear, and had produced a great quantity of straw *, and as Mr. Miller advises September for sowing it, I thought that, though I could not expect a crop, yet I might have seed enough at least for my own use, and also that I should partly judge, if properly put in and managed, whether it would answer the descriptions given of it.

It did not appear after sowing † in less than twenty-three days, to the best of my remembrance, and with it came great quantities of walder and buddle ‡, to which this land is very subject, except about a quarter of an acre, on which, after it was ploughed, I had thirty bushels of flaked lime harrowed in ; and upon this very few weeds came.

I attribute its not coming sooner to be owing to the lands being cold by the wheat, as well as the seed being sown late in the year.

Under

creasing, by the increased consumption of coals and the decrease of fire-wood in all parts of England. We should be greatly obliged to this gentleman if he would inform us what quantity of coal-ashes he laid on an acre of his poor light land, and whether he, on that account, lessened the quantity of lime, which he laid on alone to the quantity of a Winchester bushel at least each perch. See Vol. II. Numb. XC.

Did this gentleman lay on the manures, *viz.* the lime and coal-ashes, separately ; or did he mix them together by way of compost, and suffer them to lie and mellow for any time ? E. R.

* Wheat very seldom yields well after barley in this country, especially on light land.

† Our kind correspondent has not informed us what quantity of seed he allowed of the burnet to an acre : we should be glad to know. E.

‡ Many of our readers are at a loss to know what weeds our correspondent means by *walder* and *buddle* : we wish therefore he would either describe them, or inform us, if possible, by what names they are called in other parts of England. E. R.

Under these circumstances the plants were weakly; therefore I could not harrow, according to Mr. Rocque's directions; yet purposed doing it in March, or April at farthest, but was disappointed, not having one dry day in both those months.

In the beginning of May the weather proved dry, and on looking over the ground, I found plenty of plants, though weakly, except on a small piece which had, I imagine, proved too wet*. I therefore, the seventh of May, set on weeders, first to pull out all the large weeds, and afterwards the smaller; for there was not only a large quantity of walder and buddle, but also what we here call chick-weed, which last, by spreading on the ground, made the burnet more weakly than where there was only walder and buddle.

The whole expence of weeding has been under twenty shillings *per* acre, and it is now tolerably clear, and I doubt not but there will be a good deal of seed; but as it has laboured under so many disadvantages, the seed cannot be taken all together; for some is now almost ready for cutting, whilst the rest of it is not in flower†.

My sentiments on it are, that as light land is the proper soil for burnet, it should be sown in the spring with corn, or in August in furrows; and I am of opinion, that if, even after my once ploughing under the circumstances already mentioned, I had had it harrowed, and what we call here crested, or just struck with a small share, and afterwards sowed in broad-cast, it would have got into the furrows by harrowing; and then I should by hoeing have had it in my power to have cleared it from these weeds, which in broad-cast only was not in my power, without a very large expence, to have had done.

B 2

As

* We should be glad to know whether the seed failed totally in this spot. E.

† We hope our correspondent will inform us what quantity of seed he gets from his two acres; and we recommend that he should try to discover, by some easy experiments, of what real value the burnet-straw is, after the seed is separated from it, as fodder for horses and other cattle. E.

As it is, I like it, and intend not only to let it remain, but also am preparing at least eight acres of land more to sow with it in August next*.

I am, GENTLEMEN,

June 18,
1765.

Your most humble servant,

The KENTISHMAN.

NUMBER II.

A Letter from the Old Essex Farmer, containing an Account of an Experiment of sowing and transplanting Burnet, with other useful Observations.

GENTLEMEN,

IT is a duty incumbent on us to do all the good we can to our fellow creatures whilst life remains. We know not how soon we may be called from this transitory state of frail mortality to the regions of endless bliss or woe: let us therefore exert ourselves to the utmost of our power, and prepare for a better state by acts of beneficence, of which we shall never have reason to repent.

For my particular part, I am, as I have already told you, gentlemen, standing on the extreme verge of life: I feel, and sensibly too, my strength decay, my limbs almost forget to do their accustomed offices, and even my legs,

* When the two acres of burnet have gathered some strength, we are of opinion our correspondent may venture to harrow it in the manner directed by Mr. Rocque. We hope this gentleman will not omit giving us an early account of the eight acres he proposes sowing with burnet, as more depends on his experiments than may at first be imagined; for if on such poor land burnet can to advantage be sown, what must be the profits arising from it when sown on a light, rich, mellow soil? We could wish this gentleman would sow, by way of experiment, a small plot in rows, with intervals wide enough to admit of the use of the hand-hoe, and afterwards compare the produce of it with that of an equal proportion of the same sort of land sown at the same time broad-cast. E. R.

legs, those once stout supporters, now totter under the weight of their feeble master.

Thanks to the goodness of God, who has hitherto preserved my mental faculties unimpaired: my soul feels not the weight of years, but rises, as it were, superior to the frailties of human nature: will any unbeliever then presume to say, that this soul, which I feel to be so vigorous within me, shall die with my feeble and almost exhausted body, and with it moulder into undistinguished dust? It cannot be; its nature is superior to decay, and partakes of that immortality which is a distinguishing attribute of its God.

Forgive me, gentlemen, this involuntary effusion: I would say, that my wish is to do that good to others which I am not myself in a condition of partaking: this it induces me once more to trouble you with a letter, as the experience which has carried me almost through life, may probably be of some use to others.

I am glad to live to see the eyes of my countrymen so far opened, as for them to discover the value of the native indigenous grasses of England when separately cultivated.

Farmers are not so averse as may be thought to cultivating what are vulgarly called the artificial grasses: of this the immense quantities of clover annually sown in this single county may be mentioned as a proof.

Rye-grass is also here separately cultivated; but I cannot say I was ever fond of it, though I have sown a great deal of it for want of something better. It is a very coarse grass, branches but little, and is, in fact, almost the worst that can be sown separately: if of any value at all, it is when sown with clover, as its dry husky quality is thought in some measure to correct the superabundant moisture of the clover, when both are made into hay.

The burnet has of late been much talked of; and from some small experiments, which I directed a nephew of mine to make, I am greatly inclined to think
that

that it will answer well, provided a proper choice of soil be made.

Burnet should never be sown on a very stiff or wet soil: it thrives best on a gravelly loam that has some heart in it. On a crumbly whitish loam it may be sown to advantage, and it will even grow to a crop on a light sandy soil, such as I remember many years ago to have seen on Hampstead Heath near London.

If I might advise, the most profitable method of cultivating burnet would be to sow it promiscuously, but not too thick, about the latter end of August, on a seed-bed, from whence, in the spring, it should be transplanted into the field, being planted in single rows about eighteen inches distance, and the plants about nine inches distance in the rows.

In this manner the field might easily, and at a small expence, be hoed and kept clear of weeds: when I say at a small expence, I mean for less than a crown an acre, which sum we never grudge for hoeing turneps.

After the first year, the weeds will be pretty well got under; yet I would still advise, that it should be annually, at least, hoed, as this slight tillage will loosen the earth about the roots of the plants, change the surfaces of the soil, adapt it better to receive the influence of the atmosphere, the sun, the rain, and the dew; all which together will give such vigour to the burnet, as to astonish the proprietor, who may not reflect on the causes of it.

In the summer of the year 1763, I had a small parcel of burnet-seed sent me by the late very worthy Mr. Wyche. The first week in September, I ordered my nephew to sow a small plot with it; but before the end of the month I found the plants stood much too thick: this determined me to transplant them in the spring. This seed was sown on a bed in my kitchen-garden.

I was for some time at a loss where to find a piece of land on which to transplant them; but I at last recollected that the orchard had been under the plough about forty years

years before, and that the soil had been then greatly broke with coal-ashes. On examining a corner of this orchard, which lay rather high, I found that the soil was lighter and drier than any in the neighbourhood; for we all lie on a stiff clay.

I, in the next place, ordered the turf to be pared from about a quarter of an acre, and carried off, in order to its being burnt. The land was then trench-ploughed, and left rough for the winter. When the turf was burnt, I caused the ashes to be carefully gathered; and laid under cover till the spring.

About the latter end of April I desired my nephew to have the ridges harrowed down; and after the first harrowing, the turf-ashes, mixed with an equal quantity of flaked lime, were scattered as regularly as possible, on the land: by frequent harrowings afterwards it was laid quite level, and was then fit for planting, the manure being by this time well mixed with the surface of the earth.

The burnet-plants were then removed about the beginning of May from the seed-bed, and set in at the distances I have already specified. They grew extremely well, and I cut them twice last year. I did not weigh the hay, which was a great omission; but, as near as I can judge, the crops were both heavier than would have been clover, and my nephew's horses were particularly fond of it.

This spring his cows fed on the burnet; and be assured that they not only eat it very greedily, but it encreased their milk in quantity, and bettered it in quality. Two cows only were turned into it, and we intended to see how long it would last them, but unluckily, when they had been there about a week, the rest of the cows, to the number of fourteen, broke down the fence and got to it, which prevented our making the calculation we wished for.

About a fortnight ago it was laid up for a crop of hay, and you would be surpris'd to see what a progress it has already made.

So much for burnet planted on a soil certainly not adapted to its nature; yet the success has been such as might tempt any farmer who knows his interest to cultivate it on lighter land. I am, indeed, firmly of opinion, that it will prove a very valuable spring-grass, if we may, with any degree of propriety, call it by that name. The hay made of it will serve as excellent dry fodder for horses; and cows may, to great advantage, be fed with it.

My nephew had so small a quantity, that he could not try any experiment with it relative to sheep; yet I have not the least doubt but that it will prove very wholesome feed for them.

I chose to write this letter to you on the subject of burnet, because my nephew intends next autumn to plough up this corner of the orchard in order to replant it with apple-trees: this would have been done last year, but for this experiment, which was made out of mere curiosity, as we are, in this part of the county, very sensible that we have no land fit for any extensive growth of burnet; though towards Witham, Coggeshall, Lexden, Colchester, and about the Colns, it would be a great improvement.

I am happy in having lived long enough to see the farmers become as rational as other men; they are every day getting rid of their old prejudices, and will, I hope, soon be, in general, all of them capable of planning methods of husbandry founded on sound reason.

Their knowledge has hitherto been almost entirely traditional, and even this has been in practice for the most part misapplied: was it then to be wondered that so few farmers could grow rich, though their rents were low, and the times good? The rent is, in fact, the last thing to be considered in a farm; for if it is well situated, has an unimpoverished soil, of a good substance, and is well supplied with wood and water, or, if not with wood, with coals at a reasonable rate, the tenant may save money, though he pays a high rent; but then it is absolutely

absolutely necessary he should manage his land in a manner very different from that practised hitherto by our ordinary farmers.

Any fool may make a farmer, has been a saying frequently repeated in my hearing; but be assured it is far from being founded on facts. A farmer, to make the best of his occupation, requires a greater extent of knowledge than perhaps any other profession whatever; and I can venture to assert, that more money is to be got by farming, when carried on by an intelligent man, regard being had to the capital employed, than in any business I know of. I really believe it possible, in certain circumstances, to make as much annually as the whole capital amounts to; and can any one tell me of a trade wherein the capital can honestly in one year be doubled?

Surely then, gentlemen, this must be a great inducement for farmers to apply themselves diligently to the study of their business: a perfect knowledge of it is not suddenly to be acquired, and the truth is, it requires a very good natural capacity, improved by a solid, but not brilliant education. Perhaps, at some future time, if God grants me a sufficiency of health and spirits, I may inform you what I think ought to be the education of a youth intended for a farmer.

Some of your less serious readers may possibly think the latter part of this letter digressive; but about this I give myself little concern, as I know it refers to a matter of more public importance than may at first be imagined: however, I shall say no more on this subject till another opportunity offers.

I am, GENTLEMEN,

Your humble servant,

Hundreds of Essex,

A FARMER.

May 16, 1765.

NUMBER III.

The Old Essex Farmer's Method of planting Elm-Trees.

GENTLEMEN,

ONCE more, before I take my leave of mortality, let me trouble you on the subject of husbandry.

I do not just now recollect whether I told you before, that the farm I for many years occupied in this country is my own: be it as it may; however, that was my principal reason for improving it so much as I did.

About five and thirty years ago, I took it into my head to plant before my house an avenue of elm-trees; but as the soil on which they were to stand was strong, I found it necessary to use some precaution in planting them.

I, in the first place, had the land trenched to the depth of near two feet, and let it lie rough for a whole winter. In the spring of the year I got together as large a quantity of coal-ashes as I could collect in the neighbourhood, which I cast into the trenches, and had them, as much as possible, mixed with the soil, as the land was levelling.

At the proper season I sowed this piece of ground, being about half an acre, with six pecks of black oats, of which I had a tolerable good crop, about twenty bushels.

Immediately after harvest, I caused the stubble to be ploughed up, with a very thin furrow; when running a light harrow over the land, it gathered the stubble into heaps, which were immediately burnt, and the ashes, mixed with some of the earth on which the heaps stood, were spread on the land.

When this was done, I caused the land to be laid in high ridges, which I found to be strong work for six horses in a plough, for the furrow was very deep.

I again

I again laid it up for the winter, and, to my great satisfaction, in the spring found the soil most wonderfully mellowed.

After harrowing down the ridges in the spring, and giving the land two more ploughings, I ventured to sow on this half acre two bushels of barley, of which grain I had at harvest a crop which yielded me twenty-four bushels; but it was not quite so bright and fine as in the upland farms; but it was, however, far from being bad.

As the land lay now pretty level, and was, I thought, in proper order, I began, about the middle of September, to plant my elms in the following manner.

In the first place, I chose plants of a due growth; that is to say, not too tall in proportion to their thickness: they might be about the size of a man's wrist, and from six to eight feet in height.

As they had been from time to time trimmed in the nursery, I did not think it expedient to have either their roots or heads abstracted, but planted them just as they were taken up, and that as soon as possible.

Each tree was set on the surface of the land; and a little mound, or bank of earth, was then laid about its roots; over which was placed a coat of turf, to prevent the earth from falling, and leaving the roots bare.

In this manner I planted six rows of elms, three on each side the avenue; and when they were all on the ground, I caused them to be carefully flaked, lest they might have been blown down by the rude north-westerly winds.

On the outside of the rows, on either hand, I caused a drain four feet deep to be cut, in the bottom of which I laid a parcel of large flint stones, which had been from time to time picked out of my chalk: over these I laid some blackthorn and crab-tree faggots, then a coat of turf, and over all, the earth that came out of the trench.

In the middle of the avenue betwixt the rows I made, in the same manner, a third drain; and at the end they all

joined in one, leading to a brick arch, which carried off the water by a natural fall into a pond.

By this management the roots of my trees were kept from imbibing too great a quantity of moisture, and they have flourished so much ever since, as to astonish all who have seen them. What is very remarkable is, that all the trees grew up straight and regular, for not one crooked or deformed elm is to be found amongst them.

I must not in this place omit mentioning one circumstance which I reckon very well worth notice; it is this:

About fifteen years ago, induced by my curiosity, I caused the ground over one of the drains to be opened, in order to examine the state of the materials of which it was made. To my great surprise, as the drain had then been made at least twenty years, I found that the faggots were not in the least decayed; on the contrary, the wood had acquired in the ground such a degree of hardness, that it was scarcely possible to cut it with a strong sharp knife, and even when the knife had made some impression, we found that the edge of it was gone, and full of notches.

On removing some of these faggots, we found that the flints lay still hollow, with large interstices or spaces between them to give the water a passage.

I was not a little pleased with this discovery, and have since recommended this method of draining to many of my acquaintance.

From my own feelings I recommend to every young man, who has land of his own, to plant at an early age, as he will then probably live to see the fruits of his labours. You cannot, gentlemen, well conceive what pleasure I now take in walking up and down this avenue: when I reflect on the growth of these trees, many of which were planted with my own hands, my heart is thankful to the great and good God who has permitted me to enjoy innocently, I hope, at least, I wish I could add worthily, a length of days. Shall I own my partial weakness?—A few years ago I caused some wild honey-suckles

suckles to be placed about the roots of those trees I had with my own hands planted, which, being thus adorned, seem to raise their proud heads above their fellows, as if sensible of their distinguished honours.

I am, GENTLEMEN, (as usual)

Yours,

A FARMER.

Hundreds of Essex,

July 5, 1765.

N U M B E R I V.

A Letter to the Dublin Society, from Sir James Caldwell, Baronet, Fellow of the Royal Society; giving an Account of the Culture and Quality of several Kinds of Grass lately discovered.*

GENTLEMEN,

AS I think it my duty to communicate to the public whatever knowledge I acquire, that may be of public benefit, and as there can be no channel of such communication so eligible as that of a number of gentlemen associated together for the benefit of their country, with a particular view to such communications; I take the

* Extracted from the Minutes of the DUBLIN SOCIETY,
June 6, 1765.

The Reverend Dr. Mann, Vice-President, in the Chair.

ORDERED,

THAT the thanks of this Society be given to Sir James Caldwell, Baronet, for his letter to the society on the culture and quality of several kinds of grass lately discovered; and that the Rev. Dr. Mann do acquaint him therewith.

June 13, 1765.

ORDERED,

THAT Sir James Caldwell, Baronet, be requested to cause his letter to the society, on the culture and quality of several kind of grass lately discovered, to be published; and that the Rev. Dr. Mann do acquaint him therewith.

MUSEUM RUSTICUM

the liberty to address to you the following facts and principles.

When I was last July (1764) in London, I heard of a very extraordinary person with respect to speculative and practical agriculture, and immediately determined to visit him, with a view to make Ireland a sharer in the improvements which England is now reaping from his intelligence and industry.

This person's name is Bartholomew Rocque: he is a native of France, but has lived forty years in England: he is a farmer, and now lives at Walham-Green, a village about three miles south-west of London, lying between Chelsea and Kensington. Here he has lived about twenty years, is become very eminent, and has received premiums from the London Society for his discovery of various kinds of artificial grass, of which I shall give you the best account that my memory can furnish from the many conversations I have had with him.

About four years ago the late Mr. Wych, chairman of the committee of agriculture of the London Society for the encouragement of arts, manufactures, and commerce, came to him, and told him he had been thinking, that, as there are many animals which subsist wholly upon the fruits of the earth, there must certainly be some plant or herb which is fit food for them, that naturally vegetates in winter; otherwise we must suppose the Creator, infinitely wise and good, to have made creatures without providing for their subsistence; and that, in fact, if there had been no such plants or herbs, many species of animals would have perished before we took them out of the hands of nature, and provided for them dry meat, at a season when indigenous plants having been indiscriminately excluded, under the name of weeds, from cultivated fields, and places set apart for natural grass, green or fresh meat was no longer to be found.

Rocque allowed the force of this reasoning, but said the knowledge of a grass, or artificial pasture, that would vegetate in winter, and produce green fodder for cattle, was lost; at least, that he knew no such plant.

Mr.

Mr. Wych, however, knowing how very great the advantage would be of discovering a green fodder for winter and early in the spring, as it would in some measure preclude the inconvenience, trouble, and expence, of making hay, and prevent also the distress that happens when this resource fails, which is no uncommon case, wrote to Bern, and also to some considerable places in Sweden, stating the same argument, and asking the same question: his answers to these letters were the same that had been given by Rocque: they allowed that there must be such a plant, but declared that they did not know it.

Mr. Wych then applied again to Rocque, and recommended it to him to search for the plant so much desired, and so certainly existing: Rocque set about this search with great assiduity, and finding that a pimpernell called burnet was of very speedy growth, and grew near as fast in winter as in summer, he took a handful of it and carried it into his stable, where there were five horses, every one of which eat of it with the greatest eagerness, snatching it even without first smelling it.

Upon the success of this experiment, he went immediately to London, and bought all the burnet-seed he could get, which was not more than eight pounds, it having been used only in fallads; and he paid for it after the rate of four shillings a pound.

Six of the eight pounds of seed he sowed on half an acre of ground in March, in the year 1761, with a quarter of a peck of spring-wheat, both by hand: the seed being very bad, it came up but thin; however, he sowed the other two pounds the beginning of June upon about six rod of ground: this he mowed in the beginning of August; and at Michaelmas he planted off the plants on about twenty rod of ground, giving each plant a foot every way, and taking care not to bury the heart. These plants bore two crops of seed the year following, the first about the middle of June, the second about the middle of September; but the June crop was the best: the year after, it grew very rank, and produced two crops of seed, both very
good

good. As it ought not to be cut after September, he let it stand till the next year, when it sheltered itself, and grew very well during all the winter, except when there was a hard frost; and even during the frost it continued green, though it was not perceived to grow. In the March following it covered the ground very well, and was fit to receive cattle.

If the winter is not remarkably severe, the burnet, though cut in September, will be eighteen inches long in March, and it may be fed from the beginning of February till May: if the cattle are taken off in May, there will be a good crop of seed in the beginning of July. Five weeks after the cattle are taken off, it may be mowed, if that is preferred to its standing for seed. It grows at the rate of an inch a day *, and is made into hay like other grasses.

It may be mown three times in one summer, and should be mown just before it begins to flower. Six rod of ground has produced eleven hundred and fifty pounds at the first cutting of the third year after it was sowed: and in autumn, 1763, Rocque sold no less than three hundred bushels of the seed.

Miller, in his celebrated Botanical Dictionary, says, that burnet is a very hardy perennial plant, and will thrive almost in any soil; but, according to Rocque, the soil in which it flourishes most is a dry gravel; but it should be well manured for a good crop †. Lime is very good for this purpose, as the plant requires warmth and salts.

The longest drought never hurts it, for it is always in sap: and I saw a very exuberant and vigorous plant growing

* Is not this rather too large a calculation? That it is a very quick grower in summer-time, is certain; but we think half an inch a day an allowance large enough, as it will then be about eighteen inches high at the end of the five weeks mentioned above. E.

† Mr. Rocque seems now to think it will bear good crops without manure, and of course is of more value to the farmer than lucerne, which requires rich land well mended. E. R.

ing from between two bricks in a wall in Rocque's ground, without any communication with the soil; for he had cut away all the fibres of the root that had stretched downward, and penetrated the earth, long before I saw it*.

Such were the experiments that were made upon the burnet when it was found to be food for horses; and it afterwards appeared that it was equally fit for cows and sheep, and that they were equally fond of it; but the sheep must not be suffered to crop it too close.

It should be sowed by the broad-cast; and the season for sowing is from February to August. It may be transplanted; but Rocque says, that is not the best method; though, if there happened to be patches where it has not come up well, he advises to fill them up with plants taken from other places where they may be too thick.

The first year care must be taken to keep it clear of weeds; the next year it will choak the weeds, and it may therefore be said to weed itself.

As to the cultivation of this plant, he gave the following general directions.

First, Trench your ground two spades deep, or three if it will bear it; but take care not to turn up the dead ground.

Secondly, Sow it after the rate of twelve pounds to an English acre, and mix no corn with it.

Thirdly, Before you sow it, harrow the ground well.

Fourthly, After it is sowed, harrow it with a light harrow and roll it.

Fifthly, When the seed is ripe, thresh it between wet and dry, and leave part of the seed in the hay; it will then be as good as corn and hay together.

Rocque says, that if no seed is left among the hay, yet it will be nourishing food; and that he has a horse, which he keeps upon nothing else, that is in good heart, and looks well.

Vol. V. No. 23.

D

He

* Mr. Rocque has now two plants in this situation. E.

He assured me also, that burnet will cure horses which have the greafe, and that he cured one which was thought incurable, but that it is only the first crop that has this effect.—See Fig. 3. Plate I. of this Volume.

Rocque has also cultivated another artificial grafs, called *timothy-grafs**.—See Fig. 1. Plate I. of this Volume.

This was, in the beginning of the year 1763, brought over from Virginia by Mr. Wych; and Rocque sowed it in the months of September, October, and November last, in land so boggy and wet, that no horses could stand upon it; and therefore he was forced to dig it: it was a black boggy soil, and had never had any dung upon it; but as it was necessary totally to kill the weeds and natural grafs, he planted beans upon it the May before. The timothy that he sowed in November, as it was a wet season, was covered with water four months; yet the plant kept green during the whole time under the water, which did it no harm.

He says the best time for sowing it is in August, in the proportion of ten pounds to an acre †; or, as the seed is very fine, eight pounds may be sufficient.

It must be weeded the first year as soon as it is above ground, and again in the spring. If the grafs is cut in full sap, it will grow again very soon, but not otherwise; and its roots are so strong, and so interwoven with each other, that they render the wettest, softest land, on which a horse could not find footing, firm enough to bear the heaviest cart. This immediately struck me, as being peculiarly adapted to Ireland, where there is in many parts wet and boggy land.

Though a wet soil suits it best, yet there is no soil in which it will not thrive. It is, however, difficult to be
got

* It was called *timothy*, because it was brought from New-York to Carolina by one Timothy Hanson: but if they had a mind to perpetuate the memory of this person, they should surely rather have called it by his surname than his christian. C. See our Second Volume, page 161. E.

† Four or five pounds at most are sufficient for an acre of land. E.

got out of upland pasture, and therefore not fit for such ground as may be brought into tillage *.

If it is sown in August, it will be fit to mow the latter end of May, or the beginning of June. Horses are very fond of this grass, and will leave lucerne to eat it. It is also preferred by black cattle and sheep; for a square piece of land having been divided into four equal parts, and one part sowed with lucerne, another with saintfoin, a third with clover, and a fourth with timothy, some horses, black cattle, and sheep, were turned into it, when the plants were all in a condition for depasturage, and the timothy was eaten quite bare before one of them touched a blade of the clover, lucerne, or saintfoin †.

I saw also, at Mr. Rocque's, a grass called flote-fescue, a grass of the same kind with the timothy, but finer, and reckoned the richest that grows: this will flourish though covered with water, and must be managed in the same manner as the timothy.

The celebrated Linnæus, in his *Flor. Suec. (i. e.)* Flowers of Sweden, says, the bran of this grass will cure horses of the botts, if they are kept some hours afterwards from drinking.

Rocque has also growing in his ground another grass, called fold-mead ‡, which Mr. Wych brought, in the year 1763, from America with the timothy: it is a plant of great verdure and fine appearance; but as very little of the seed has grown, there has been no opportunity for experiment. In some future correspondence with this great artist in agriculture, I may probably learn more of it.

Some gentlemen in Virginia have lately sent over to the London Society a seed of a plant which they call orchard-grass, of which they give the following account.

D 2

“ It

* See Vol. I. of our Work, page 233. E.

† For a particular account of this experiment, see our Second Volume, page 60. E.

‡ The fold-mead grass, and the bird-grass, of which a particular account is inserted in this month's publication, are the same.—See Fig. 4. Plate I. of this Volume. E. R.

“ It is in great estimation in New England ; it delights in a moist rich soil, but will grow in almost any ; and its peculiar excellency is, that it will thrive under the greatest shade, and under the dripping of trees without growing rank and four. When cows are put into it, they may rather be said to devour than eat it. Sheep are equally fond of it ; but when it is young, they bite it too near the tender roots.”—See Fig. 5. Plate I. of this Volume.

As the seed of this grass has come but very lately over, no trial has been made of it as yet ; but the gentlemen who give this account of it, are of the greatest credit and probity.

I gained also another piece of intelligence from Rocque, which is equally interesting : he says that white-beet is a most excellent pasture for cows ; that it vegetates during the whole winter, consequently is very forward in the spring ; and that the most profitable way of feeding cows is to mow this herb, and give it to them green all the summer. It grew in his garden, during a very great drought, no less than four feet high, from the thirtieth of May to the third of July, which is no more than one month and four days.

In summer it grows more than an inch a day, and is best sown in March : a bushel is enough for an acre, and will not cost more than ten shillings. It thrives best in a rich, deep, light soil : the stalks are very thick and succulent, and the cows therefore should eat them green.

The seed of the great cabbage of Anjou was not long ago sent to Mr. Wych by the Marquis of Turbilly ; and this also was sown by Rocque in July. It grew all the winter faster than any other cabbage ; and, when cut, produces excellent sprouts in great plenty. It was last July, when I saw it, five feet high, and boils very green.

This rural philosopher also delivered the following sage precepts, which I received for the advantage of all to whom your benevolence and public spirit shall think proper to communicate them.

To ascertain at what time grass grows the fastest, cut it when it is about eighteen inches high and weigh it ; in
about

about six weeks cut it again and weigh it, and so from time to time at equal intervals; and that interval in which it is most increased in its weight, is certainly the season in which its growth is greatest.

To know which grows the fastest of several kinds of grass, the drills must be equal in length and number, and the soil the same. To know what soil produces the greatest vegetation, other things must be equal, and the soil different.

Some kinds of grass that are short will weigh more than others that are long, because some furnish more at the bottom than others at the top.

It would turn to very good account if some ingenious person was employed to collect and class all the grasses, and make experiments upon them.

With the lucerne mentioned in this paper, I make no doubt but many of you, gentlemen, are very well acquainted; but, perhaps, Mr. Rocque's culture of it exceeds any thing that you have experienced. If the land be good, the produce is incredible; it has been mowed five times in a season. Rocque has ten acres in lucerne; and in the season of 1762, he sold the first, second, third, and fourth mowings at a shilling a rod, which came to thirty-two pounds an acre. He then mowed it a fifth time, and this mowing produced him about three pounds an acre; so that in that year he made no less than thirty-five pounds an acre of all the ground that he covered with this grass*. He does not, however, in general, approve mowing it so often; for he says, that it bleeds too much, and that too much air is given to the natural grass which the ground is inclined to bear.

In the culture of all artificial grass, the natural grass is to be considered as a weed, which, if not at first wed out of the ground, will soon destroy and over-power the artificial grass.

I have

* See Mr. Rocque's account of this extraordinary profit, in page 296. of our First Volume. E.

I have added a very particular account of the instructions given by Rocque for the cultivation of lucerne * from his own experience.

The seeds of the other kinds of grafs and plants that are mentioned in this paper I have brought over with me, and shall immediately set myself to cultivate them with all the diligence and skill in my power; and, if I am not precluded by earlier experiments, or better intelligence, I shall take the liberty to communicate the result to the society.

I have the honour to be, GENTLEMEN,

With the highest respect,

Your most obedient,

And most humble servant,

JAMES CALDWELL.

NUMBER V.

An Account of the Culture of Carrots, and their great Use in Feeding and Fattening Cattle, as practised by Mr. Robert Billing, Farmer, at Weasenham All-Saints, Norfolk.

GENTLEMEN,

IN your Second Volume, page 370. I find it recorded, that Mr. Robert Billing had a premium given him, by the society for promoting arts, for sowing thirty acres and two roods of carrots for feeding cattle. Now, as Mr. Billing has drawn up an account of the methods he used in the culture of his carrots, which has since been published by the desire of the society, I think you cannot do the world a more acceptable service than to insert in your work, which is the only proper repository of improvements in agriculture, an abstract of the above account. Such an abstract I have therefore sent you, wherein the honest farmer's

* As we have already inserted Mr. Rocque's method of cultivating lucerne, it is quite unnecessary here to repeat it. E. R.

farmer's sense is always retained, though I have taken the liberty of pruning off some exuberances.

Mr. Billing observes, that the use of carrots for the winter-feed of cattle has been long known and practised in the eastern parts of Suffolk, where it is common to make carrots serve the same purpose turneps have many years done in most parts of the county of Norfolk; besides that many are sent from thence to the London markets: but carrots never have been sown in the latter county, for the maintenance of cattle, till he tried a small parcel in the year 1761, and another in the year 1762.

He thought it prudent, he says, to make those trials before he became a candidate for the premium offered by the society; the hopes of deserving which encouraged him to venture a pretty large and unusual expence, as well as the loss of a great part of his winter-crop, and which has thus become the means of making known, in his part of the country, a species of husbandry with which they had before no acquaintance but by hearsay, being above fifty miles from the country where it had before prevailed.

In the year 1763, he sowed thirty acres and an half by mensuration.

This quantity of land lying in three parcels, one, of thirteen acres, bore wheat in the year 1762; one, of half an acre only, had borne clover; and the last, of seventeen acres, turneps that year. The piece of thirteen acres is a cold loamy soil, shallow, and upon a sort of loamy gravel. The half acre is a soil much mixed, upon a moist clay. The seventeen acres may be divided into two parts, the one of fourteen acres, and the other of three. Both are a light and dry soil, newly improved with a marle; the former, an exceeding good-tempered soil, upon a marle; the other, a shallow black sand, upon a kind of imperfect grit-stone, called in Norfolk a carr-stone.

Previous to giving an account of the success of his crop of carrots, and of the use he made of them in feeding cattle, he describes the manner in which he cultivated these several pieces of land, founded as well upon the

best information he was able to procure, as upon the observation afforded him by his own experience of the former year.

The wheat and clover stubble he split down with the plough early in the preceding November; and is satisfied, from all the observations he has made since he first begun the cultivation, that whether the wheat-stubble be, as it is called in Norfolk, flat work, or in ridges, or the carrots are to be sown after clover or rye-grass, the land cannot be ploughed too early; so that the frost and snow may have their full effect in mellowing the ground, for the reception of so small a seed; and this is more necessary to be attended to, the stiffer and tougher the soil shall chance to be.

The land that had been turneps he let alone till the end of January, or beginning of February, thinking this time enough, because the earth was thoroughly cleaned by the cultivation and summer-hoeing necessary for the crop of turneps.

Of the thirteen acres of wheat-stubble, six were dunged for wheat, but not for carrots; four and an half not dunged at all; and two and an half for the carrot-crop only. The clover-land was dunged for the carrots: and of the seventeen acres that had been turneps in 1762, part had been tathed* for the turneps; and the whole crop of turneps was fed off by sheep and neat cattle.

Four pounds of seed on an acre is sufficient: but as the seed is very small, light, and hard to separate and disperse equally on the ground, he was at first a good deal puzzled how to overcome this difficulty; and though he was advised to make use of a mixture of sand, he did not find it answer, because the weight of the sand carried it all to the bottom of the seed-cot: he sows it therefore now unmixed, as they do turneps, after having forced it through a fine chaff-sieve by rubbing.

It will be three weeks after sowing, and sometimes longer, before the carrots appear: this is the principal advantage, besides the difference of expence, that turneps

have

* Tathed, i. e. where sheep have been folded.

have over them, for the latter are not sown till about Midsummer, and coming quicker to the hoe, get the better of the weeds more easily; for weeds do not grow near so fast about Midsummer as in the spring.

The carrots lying a longer time before they come up, and continuing afterwards a long time very weak, they are seven or eight weeks before they are fit for the hoe, and in the mean time afford the weeds an opportunity to get strength, in a season too, when unluckily they grow the fastest: Mr. Billing is therefore of opinion, that, though it is necessary to sow carrots before turneps, it is better to sow them as late as you can with safety to the crop; for, of his, those sown in April on the clover stubble came much the soonest to the hoe, though later sown.

The wheat and clover stubble were ploughed three times; the piece after turneps but twice, the first time shallow, the second as deep as the staple of the ground would permit; and on this ploughing the carrots were sown.

As it would remove some of the objections to a carrot-crop, and lighten much the expence of weeding, could they be sown later; and as this might be done, could the seed be made to come up sooner, this sensible farmer imagines the seed might be steeped in somewhat that would forward its vegetation, and afterwards sown, when dry enough to separate.

Yet however expensive the strength of the weeds in a carrot crop makes the hoeing of them, the crop itself is not apt to suffer; for though the young carrots are quite covered in a thicket of weeds before hoeing, and should be buried in earth after hoeing, yet they seem no way hurt if they get clear again, as they will generally do if they are not cut off, or buried too deep for want of skill, in a fortnight after hoeing.

The Norfolk hoe is six inches wide. If the carrots chance to be tolerable clean, they may be hoed the first time for eight shillings *per* acre; but if much rain, the

foulness of the ground before sowing, or the length of time between the sowing and hoeing, or all these things together, have filled the ground full of weeds, the expence of the first hoeing will amount to ten or twelve shillings *per acre*.

About ten days or a fortnight after hoeing, they should be harrowed: this will displace the weeds, and prevent their growing again, which many of them will probably otherwise do, especially if it be showery weather: the harrowing does not hurt the carrot plants, but, on the contrary, does them much service, by bringing fresh earth to them, as well as killing the weeds.

About three weeks after the harrowing, in case it has not perfectly cleaned the ground of weeds, or in case new weeds come up, Mr Billing hoes the carrots a second time, which costs about four or five shillings *per acre*, as the ground is more or less foul; and after this, if there still remain any weeds, which will be the case if much rain falls in the time of the second hoeing, a second harrowing is bestowed.

Where the weather has been favourable, and those employed to hoe have done their duty, the carrots once hoed and harrowed have been as clean as those on which two hoeings and as many harrowings have been bestowed.

Mr. Billing next proceeds to inform us of the success he had, in the year 1763, on the several parcels of ground first described. His carrots proved best on the piece of two acres and a half that had been wheat, not dunged for the crop of wheat, but dunged for the crop of carrots, and on the half acre clover stubble dunged for the carrots.

Many carrots out of both pieces measured two feet long each root, and in circumference at the upper end, those on the former from twelve inches to fourteen, and on the latter from twelve to sixteen inches; a difference of bulk owing, perhaps, both to the difference of soil and the effect of former crops.

On the two acres and half Mr. Billing computes he had from twenty-two to twenty-four cart-loads *per* acre*, and about fifty-five or fifty-six cart-loads on the whole: the half acre on clover-stubble produced about twelve loads; the six acres and half dunged for wheat, but not for carrots, produced from eighteen to twenty cart-loads *per* acre, and in the whole about one hundred and twenty-four loads; the four acres not dunged for either wheat or carrots, produced from twelve to fourteen loads *per* acre, and in the whole make fifty-two loads.

He had but an indifferent crop of turneps the preceding year, on the seventeen-acre piece, but had from sixteen to eighteen cart-loads *per* acre of carrots on fourteen acres of it, but a very poor crop on the three remaining acres; so that he computes he might have on the seventeen acres after turneps not quite two hundred and seventy loads, which make, with the former, about five hundred and ten loads of carrots, equal in use and effect to near one thousand loads of turneps, or three hundred loads of hay, as experience has convinced him in the various ways he has tried them.

Mr. Billing thinks it is not improbable he might besides lose five or six loads, which the poor people took, instead of a single load they might have stole, had the land been with turneps; but this loss will evidently be much lightened, should the growth of carrots become general in the country.

The best method of drawing the carrots is with a four-tined fork, with which a man breaks the ground six or eight inches deep, very carefully, without injuring the carrot; and is followed by a little boy, who gathers the carrots and throws them in heaps.

Our farmer began to draw his carrots for use about three weeks after Michaelmas; but as the cattle he meant to feed on them had never yet been used to so hard a

E 2

feed,

* We wish Mr. Billing had mentioned how much his carts hold. Were they tumbrils with which dung is carried on to land, or carts, such as those used for getting in hay? E.

feed, he thought it best to give them, at the same time, both cabbages and carrots, lest they should suffer by a distaste at the beginning.

He had about forty loads of cabbages growing on one half acre, equal in use, as appeared on trial, to about seventeen or eighteen loads of carrots. He observed, that cattle of every sort naturally eat the cabbages as readily as they would have done turneps; and soon after having gradually learnt to eat carrots, began to prefer them. Both the cabbages and carrots, and afterwards the latter with turneps, were brought from the place where they grew, to a pasture close; and without any other preparation than shaking off the dirt, they were dispersed on the ground for the cattle to feed on promiscuously.

From the experience Mr. Billing has had in fattening cattle on turneps in houses or stalls, he says he well knows, that by this means the carrots might have been made to go a good deal further; but, besides the great trouble attending this method, especially if the number of beasts be great, and the hazard of the beasts foundering in their way to London, an accident that often happens to stalled cattle, and that the benefit of their sale is lost to the ground, he is convinced the beef is not so good, though, perhaps, more slightly.

The first stock he began to feed in this manner were twelve neat beasts, and forty-nine shearing wethers, that is, not quite two years old: ten of the former were Norfolk-bred steers, and began to feed on the first carrots he drew: at the same time he put on a cow and a heifer three years old. At Old Martinmas Mr. Billing bought seventeen Scotch bullocks; which, with a cow from his dairy, made up the number thirty; and soon after he increased this number to thirty-three, by adding three more from his dairy.

It is, however, to be observed, that when the cabbages were spent, he allowed a load of turneps each day for some time for this stock of cattle, which, with three loads of carrots, was a sufficient provision for them. This enabled

enabled him to determine that one load of carrots is nearly equal to two of turneps; for of the latter it would have cost him little less than seven loads, computing on the experience of many years fattening cattle with turneps; yet he never knew cattle thrive faster.

Nine of the steers were sold fat in Smithfield the seventeenth of February, and weighed about forty Norfolk stone, that is, seventy London stone each. Another steer and cow were killed in the country, the last in Weasenham town, which died very fat, about the same time: the Scotch were sold at St. Ives the beginning of May: the steers sold in Smithfield for about seven pounds fifteen shillings each.

Our farmer being told the market was then low there, sold the Scotch, all but one, at St. Ives, where they rendered him about seven guineas each.

The former cost about four pounds ten shillings each; the latter, three pounds fifteen. The other Scotch he sent to London, where, though it weighed but little above sixty stone, it sold for eight pounds, and was said to be some of the fattest beef killed in London that winter, as the salesman, Mr. Brownsworth, informed him: the others were not inferior.

The forty-eight wethers were sold fat at St. Ives in the month of May, for about fifteen shillings each.

These thirty-three beasts, and forty-eight sheep, rendered Mr. Billing, according to his computation, profit about one hundred and twenty pounds; out of which, allowing one tenth for the share the cabbages and turneps had in fattening them, which is rather too much, especially as the cattle soon began to leave the turneps, there remains one hundred and eight pounds to be carried to the account of the carrots.

The large quantity of carrots our industrious farmer had growing, gave him also an opportunity of trying their use in feeding dairy cows, sheep, horses, and hogs.

In the month of April he found he should have nine or ten acres to spare, beyond what was necessary to complete

plete the fattening his bullocks. This happened too at a time when his turneps, as well as his neighbours, began to decay, and enabled him to supply that defect, to which the Norfolk farmers are very subject in the spring of the year, and which no method of managing their turneps did ever exempt them from, when the weather is wet and frosty by turns; and from this decay the carrots seem protected by their hardness. From this time he fed his whole dairy of thirty-five cows, and his flock of twenty-one score of sheep, on carrots.

At the same time he thought of a method of getting the carrots out of the ground with more ease and expedition than he had before done, which was of great use when he had other occasions for his servants; besides that it prepared the land better for the ensuing crop.

They were ploughed up with a narrow-sharred wheel-plough: going slow, the share opened the earth, and cut very few of the carrots. Those few were such as chanced to meet with the point of the share.

The plat, or earth-board, turned most of the carrots out of the ground, and, by harrowing afterwards, were most of them quite cleared from the earth: although the roots extended a good way into the ground, and below the pan, he did not find it necessary to plough so deep, and consequently the land suffered no damage, which otherwise it might have done, as some few of the carrots, instead of being turned out, were buried: at the same time it was necessary to plough the land, and harrow it a second time; and though this should be at an interval of a month, the buried roots will take no harm.

Mr. Billing turned his dairy of cows and flock of sheep on this land after the ploughing, without any further trouble or preparation, and had all the reason in the world to be pleased with the event: both took readily to eating the carrots, though he thinks the cows most so.

These last, not only all of them gave more milk than usual at this time of the year, but many of them continued to give milk, which would, with such turneps as he
he

he had then to give them, have been nearly dry: the butter made was likewise much better than from turneps, and both sheep and lambs did much better than he ever remembers them to have done at this season of the year: besides this, the land received great and manifest improvement from the state of the cattle, of which he found the benefit apparent in the succeeding crop.

It is proper to observe, that in this method, some few of the carrots will continue buried even after a second ploughing; but these were turned out upon a third ploughing, when barley was sown, and were clean eat up by the flock of sheep, without the least injury to the new-sown barley.

In this manner the cows and sheep were fed for three weeks, which Mr. Billing values at above twenty pounds; and, considering how he might have suffered had he wanted turneps, and not been able to supply the want with carrots, he thinks he might value this feed at a good deal more.

In November 1763, he began to feed sixteen horses, which did all his farming work, with carrots: they had neither hay nor corn, except the team that carried out his corn to Brancaster, a sea-port at fifteen miles distance: to this team he allowed a bushel of oats a day for the whole team; the rest, besides carrots, had nothing but peas-straw, and chaff, until the sowing barley: in April he encreased their work so much, that he thought it necessary to give them a few oats; but they continued chiefly to subsist on carrots, until they were turned to grass the latter end of May.

Mr. Billing declares he never knew his horses in better order, or do their work better; and they were so fond of carrots, that he frequently found, that when the team spoke of before were so fatigued that they refused to eat their corn, they would eat it mixed with the carrots chopped.

It may be proper to observe, that for his horses he always chopped off the heads and tails of the carrots, and
sometimes

sometimes gave them another cut. Though he could not find it was necessary, he washed them too for the horses; none of which trouble he found at all necessary, or even useful, for other beasts: the gathering and removing the carrots, and dispersing them about the pasture-land where he fed the beasts, the weather clearing the roots, were sufficient.

Mr. Billing gave the sixteen horses two loads of carrots every week; and these two loads he computes saved him more than a load of hay: this saving was for twenty-eight weeks; so it saved him twenty-eight loads of hay, which, at twenty-five shillings a load, amount to thirty-five pounds.

To this might be added, the benefit received by swine, to which he threw all the tops and tails of the carrots used for the horses; and they thrive exceedingly, and were so fond of them, that he could never find that any dirt that might stick to them prevented their eating them: but as the principal part of the food of the swine was milk at first, and afterwards peas, our farmer has not set any value on this part of his profit; the value of what he has estimated it on the other articles amounting to one hundred and sixty-three pounds.

Of the thirty acres and half, four were sown in the present year with oats, all the rest with barley: the four acres was part of the land where he ploughed up the carrots; the rest of this piece was sown with barley: both were a prodigious crop, not less than three loads of corn in the straw *per* acre: on the rest of the land his crop was less bulky and shorter, yet very good, perhaps not less grain than the other. And here it may not be improper to mention, that when in a former year he had sown the two ends of a large close with carrots, without dung, and the middle with turneps, for which the land was well dunged, yet, when the whole enclosure was the next year sown with barley, that after the carrots was the best.

Another recommendation of carrots is, that our intelligent farmer finds them a more certain crop, both for
growth

growth and duration, than turneps: the latter are exceedingly apt to fail, as well as rot, towards the spring when most wanted. Perhaps the former is in some measure owing to the lands in Norfolk being, as one may say, surfeited of turneps, to which they have been so long accustomed. This is the conjecture of some of their most experienced farmers; but if otherwise, there are many reasons for chusing both, that, if one fail, we may rely for so necessary a winter provision on the other.

This candid farmer thinks he ought not, however, to conceal, that at first beginning of a new sort of husbandry, many difficulties stand in the way: the expence is very heavy, much beyond the expence of turneps, and is, perhaps, increased by the awkwardness of labouring men and servants, who are both ignorant and perverse about most new employments: besides this, the cleaning of carrots from weeds is much more necessary than of turneps, and yet goes on much slower, so as sometimes hardly to be completed: and moreover, if a long-continued frost should happen, it will be very difficult to get carrots out of the ground; (it is true, the turneps in this case are apt to spoil) but this inconvenience may, in some measure, be prevented, by drawing the carrots before-hand; though this will be difficult to do, to the amount of fifty or one hundred load.

The above is a faithful and exact account of every material circumstance that has occurred to Mr. Billing in relation to the culture and use of carrots, for the feeding of cattle: he is fully sensible that more extraordinary things may be boasted of, upon the most careful attention a diligent and curious man may be able to bestow on two or three acres only; but besides his having been careful to avoid exaggeration in every particular, the large quantity of carrots he raised in the year 1763, gave him an opportunity of judging fully, and without danger, of any considerable fallacy, what may be expected from the common use of carrots in feeding every species of cattle on them, in an extensive way of farming.

He had last year twenty-four acres and half growing, for the use he applied the other to; the effect and profit of which, together with such further observations as may be thought necessary, follow in the next article.

(Signed)

ROBERT BILLING, Farmer.

The contents certified }
to be true, by

JOHN FRANKLIN, Vicar.

Nov. 21, 1764.

NUMBER VI.

An Account of the Soil, Culture, Time of taking up, Produce and Effects of Twenty-four Acres and an Half of Carrots, for which Mr. Billing's Certificate was granted in the Year 1764.

THE said twenty-four acres and an half are all in one inclosure, and the land all in quality much alike, a close cold sand, upon a sort of loamy brick earth, a little gravelly.

In the year 1763, the land bore peas. In the beginning of the following winter, Mr. Billing ploughed up the land as deep as the soil would permit, in order to receive the benefit of the frosts and snows in mellowing the land, and ploughed it twice more before he sowed the carrots; but having the best crop of his latest-sown carrots last year, which was about the middle of April, he did not sow these last till the beginning of May; which, he finds by the scantiness of his crop, was too late.

It was about seven weeks from the sowing to the time of hoeing. The Norfolk hoe is six inches long; and, if not very foul, they are hoed for eight shillings per acre.

The care in hoeing is only to cut the weeds, and leave carrots enough growing; for, though the carrots, many of them, are buried with mould or weeds, they will get through in a few days without hurt.

If much rain follow soon after hoeing, it will be necessary to harrow them, about ten days after hoeing, to displace the weeds, and prevent their getting root again. About a fortnight after the harrowing, if much rain should come, it will be necessary to hoe them a second time, which costs about four shillings *per* acre; and after that, if much rain should come soon after, they should be harrowed again. The harrowing does not pull up one carrot in a hundred.

The fore part of the winter of 1763, he dug them up with a four-tined fork, a man breaking the ground with the fork, four or five inches deep, and a little boy pulling them up, and throwing them in heaps.

Towards the spring he ploughed them up, having a share with a narrow point, which answers very well; which method he now follows, for he has ploughed up all last year's growth.

The plate of the plough does gradually raise the mould, and draw up the carrots, except a few cut with the point of the share; then he harrows them out; which ploughing and harrowing are no expence, the land being got in order by that means to sow with corn.

Some of the carrots will not harrow out the first ploughing; they will turn out on harrowing after the second ploughing. The feeding them on the land where they grow improves it greatly.

Mr. Billing thinks the quantity of the crop, to take the whole piece through, is about ten loads *per* acre, the last having proved an unkindly year; besides that they were sowed too late.

He gave two loads a week to eighteen horses, to which he allowed no corn or hay, except one team, which carry out his crop at fifteen or sixteen miles distance, till about April, at which time work comes on generally in a great hurry.

His horses are in as good condition as in former winters, when they have eat forty loads of hay, and two or three lasts of oats, more.

He kept about forty cows and three hundred sheep on them a fortnight, and expected, when he wrote the account, to have enough remaining to keep them a fortnight longer.

His cows gave plenty of milk, which made fine pleasant-tasted butter: and his sheep and lambs thrived exceedingly, which, with only turneps, would do very poorly. He had fourteen weanling calves kept chiefly with carrots, which thrived wonderfully; and about thirty hogs were kept principally on them for several weeks.

It was the less necessary for Mr. Billing to be particular in this account of the culture and management of carrots in general, as he had enlarged much upon the subject in the other piece.

For my part, I own to you, gentlemen, I think the nation is greatly indebted to Mr. Billing for his spirit in making his experiments so much at large. The farmer may now, without hesitation, adopt this culture; and if his soil is adapted to the growth of carrots, he need not in the least doubt but that they will greatly encrease his annual profit. That they are a wholesome feed for cattle has been long known, but that such advantages resulted from their use as Mr. Billing relates, few farmers could have imagined.

The field culture of turneps was, if I mistake not, first introduced by the great Mr. Tull; yet many years elapsed before the farmers could be brought to open their eyes to their own profit. We had not then, it is true, a society for promoting useful arts: let me therefore hope, as we now enjoy that noble advantage, that the culture of carrots will soon become general on all light deep soils, under the influence of a body of patriotic members, whose sole view is to do good to their country.

I am, GENTLEMEN,

Your former correspondent,

London,
July 13, 1765.

EBORACENSIS.

NUM-

NUMBER VII.

The Efficacy of Mr. Rocque's Method of cleaning Lucerne with Harrows, demonstrated.

GENTLEMEN,

AS there have been of late many disputes respecting the best method of cultivating lucerne, it cannot be unacceptable if I relate to you a fact of which I was the other day an eye-witness.

Many say it is much the best way to sow lucerne in rows with intervals, and to keep it clean from weeds, either with the hand-hoe alone, or assisted by the horse-hoe. The very ingenious and observing Mr. Harte recommends, in his Essays on Husbandry, the culture of this plant by transplantation, and seems to have no opinion at all of the broad-cast method of sowing, which I am next to mention.

Mr. Rocque of Walham-Green recommends the sowing of lucerne broad-cast, and keeping it clean with harrows, observing, from many years experience, that the harrow-tines do not in the least injure the plants. Mr. Rocque does not pretend to have invented this method, as he well knows, and acknowledges, it has been long practised in many parts of France, with the greatest advantage to the farmer.

I have seen lucerne sown in rows, and cleaned with hoes; but the expences, especially within fifty miles of London, are so considerable, and the trouble of cultivating in this way so great, that farmers are almost universally discouraged from undertaking this culture.

It was necessary some method should be recommended, that would not greatly differ from the farmer's ordinary practice, as without this there could not be the least chance of having much lucerne sown for sale. All these advantages, besides a vast superiority in point of crops,
are

are possessed by the method practised by Rocque. The seed is sown like clover, and it is cleaned as easily as a fallow is harrowed.

But, say the opponents, is this strictly fact? Does the harrow clean the lucerne enough? To this I answer, It does.

The day before yesterday I went, as I have often done before, to see the state of Mr. Rocque's improvements; when, after a little conversation, he requested me to cross the road to see his field of lucerne, which he had lately mowed.

This field contains two acres, and at the time of mowing was very foul, being over-run with weeds and vast quantities of natural grass.

As soon as the crop was got off the land, Mr. Rocque caused it to be passed over two or three times with a pair of heavy harrows, well loaded with timber, stones, &c. These so effectually cleaned it, that when I saw it, which was about a fortnight after the mowing, there were very few weeds to be seen on the land amongst the plants; but on one side there lay several loads, which the harrow had dragged up by the roots.

Mr. Rocque assured me, and I believe him to be a man of veracity, that no other method had been used to clean this piece; and at the time I mention, the plants looked healthy and vigorous, were grown to the height of near ten inches in most places, and stood thick enough on the land to yield a large crop of hay or seed. On examining the plants more nearly, I could not find they were at all injured by the tines of the harrows, and the surface of the earth was almost as much loosened as it would have been by a slight ploughing.

I would recommend it to such of your readers as are still incredulous, to go to Mr. Rocque's, where they may at any time have ocular demonstration of the truth of what I here assert.

Let not then my brother farmers be so timid and fearful of success: for my part, I am determined, as soon as possible,
to

to lay down fix acres of my best light land in lucerne, following Mr. Rocque's practice; and, from what I have lately seen, I have not the least doubt but that I shall meet with the wished-for success, and reap considerable advantage from what may by some be called my boldness. The truth is, that lucerne is so valuable a fodder, that, was the hazard much greater than it really is, still would it be well worth while to sow it; for, should a farmer fully succeed only once out of three times sowing, he would have reason to be abundantly satisfied: and what should farther induce him to adopt this culture is, that, should he not succeed, the expences are so trifling, that, though the whole should be thrown away, he will not have any important loss.

I am, GENTLEMEN,

Your very humble servant,

July 1, 1765.

A MIDDLESEX FARMER.

NUMBER VIII.

A remarkable Experiment relative to Grasses, lately made by Mr. Rocque.

GENTLEMEN,

SOME of your correspondents have doubted whether timothy-grass will grow on an upland dry soil: permit me to lay before your readers a few words on this important subject.

I candidly acknowledge that this grass will thrive best, and grow most luxuriantly, on a damp soil; yet must I at the same time beg leave to assert, that it may, to great advantage, be sown on a light upland loam, provided it has some heart in it.

Mr. Rocque, who is indefatigable in his endeavours to ascertain by experiments the qualities and value of the several kinds of grasses, in order to convince himself whether timothy-grass would grow on a light dry soil, has lately made an extraordinary experiment.

Calling

Calling on him last week, he shewed me what he called his park. This is a spot, containing about half a rod or perch of land, in one of his yards: it is fenced in, with pipe-staves I think, to keep the soil, if it may be so called, on which the plants grow, from crumbling and falling. This soil is no other than an apparently-barren dry sand, which was by him purposely laid over the surface of the natural ground in this spot to the depth of about a foot.

On this sand were last week growing several plants of burnet, timothy, and bird-grass: the first was even thriving and vigorous; the last were seemingly healthy and strong, though, it is true, the timothy was not so luxuriant as it would have been in a moister and richer soil. The bird-grass looked very well, and all the three were advancing a-pace towards a feeding state.

This plot, as far as I can understand, has never been watered, except by the casual rains, of which it participates equally with the other land; yet do these three grasses not only grow, but thrive on it.

May we not, gentlemen, from this experiment conclude, that timothy-grass will thrive on a good light loam? and perhaps the hay made from it, when growing on such a soil, would be preferable to that made from it when growing in a low, moist, rank earth. The more luxuriant any plant is, of which hay is to be made, the coarser must the hay needs be: this, I think, must be allowed; and this is the reason, I say, that a moist soil, which makes timothy-grass very luxuriant, will yield a coarser hay than a light dry loam.

I cannot but be of opinion, that timothy-grass would be a very proper plant to cultivate in our meadows: we now strangely neglect this branch of husbandry, suffering many sorts of grass to grow promiscuously in our meadows; so that, when the grass comes to be mown, we find that some have shed their seeds, and are become dry and sticky; others are in full flower, and very many of the later grasses have not pushed forth their flowering stem, but, being in a thick tuft near the earth, easily escape the careless

careless mower's scythe. By this means the farmer loses near half his crop of hay; whereas, had he ploughed his meadow, brought the land into good tilth, and sown it with timothy, or some such other grass, the whole ground would have been at the same time in order for mowing, and the burthen of grass at least doubled.

Is not this, gentlemen, encouragement sufficient for the separate culture of good grasses? Let us rouse ourselves from this unprofitable lethargy, and apply in earnest to perfect those methods of husbandry, on which I may venture to say our all depends.

We know that when agriculture flourishes, we cannot fail being a rich, powerful, and happy nation. To follow the various occupations of it close will be a continual spur to our industry; it will procure for the poor wherewithal to eat, and clothe themselves; besides, we shall not then see in all parts so many sturdy beggars and stout rogues, who now continually loiter, seeking whom they may prey upon. It is a great happiness that the more improved the state of our agriculture is, the more hands does it require; so that we may safely venture to assert, that where a country is well cultivated, there cannot be many idle people*.

I need only mention Holland, as a proof of the truth of what I say. Let us hope that England will be soon as much a garden as we see Flanders and the United Provinces.

I am, GENTLEMEN,

Your humble servant,

Chelsea,

A GENTLEMAN FARMER.

July 10, 1765.

* The nearer the field-husbandry approaches to the garden-culture, the more perfect it is; and we all very well know, that gardeners employ, in proportion, three times, at least, more hands than farmers can.

NUMBER IX.

On the Burnet, Timothy-Grass, Bird-Grass, and Orchard-Grass, with Specimens of each.

GENTLEMEN,

I Approve much of the public spirit of many of your correspondents, and hope great benefit will result to agriculture from their valuable communications.

We seem now, I think, to be in earnest in our endeavours to improve the state of our pastures and grass-lands; which branch of agriculture must be, by the impartial, allowed to want much amendment.

Such of your readers as live at a distance from the metropolis, will undoubtedly be pleased to see accurate representations of the new grasses, which at present make so much noise in the world; and I have not the least doubt that you will contribute all that in you lies, gentlemen, to gratify this their laudable desire.

This being my opinion, I have taken upon myself the trouble of procuring the specimens I herewith send, presuming that you will get them accurately engraved.

Fig. 1. (see Plate I. of this Volume) is the timothy-grass in flower in its natural size, being a fine and large specimen*.

The timothy-grass has been already treated of by several of your correspondents; yet I must beg leave to add a few words to all they have said. This grass thrives best on a moist, low, but somewhat rich soil; yet may it to advantage be sown on any soil where natural grass would not easily be burnt up in a dry summer. It grows to a great height, with a broad leaf like wheat: the stalk of the specimen I now send you was at least five feet six inches in height, and yet was not picked from the rest on account of its height. I gathered it last week in Mr. Rocque's ground, at Walham-Green; at which time
he

* This grass is in North-America also called herd-grass.

he shewed me a spot where the timothy had been mown in full sap, about three weeks before; and I assure you it had already assumed a verdure that would have surprised you; for it was grown very thick, with broad and beautifully-green leaves, at least ten inches long. The greatest part of Mr. Rocque's timothy is transplanted; but this was only done for the conveniency of saving the seed, as it is now disposed in regular rows, resembling at a distance a fine crop of wheat.

When a farmer sows this grass, either for mowing or feed, he may spread it broad-cast over his land; and four pounds of seed at most, as it is very small, will be enough for an acre. He must observe to keep it very clean by weeding and hoeing the first year; afterwards it will mat so much at the root, and spread so fast, that it will soon choak the weeds and natural grass.

When hay is to be made of it, the timothy should be mown before it shoots up into ear; for, if it is left till then, the hay will be coarse, and the roots will not so readily send forth new blades; but if it is cut in due season, namely, when it is in full leaf, and before it sends out to any length the flowering stem, the farmer will have a crop he will have great reason to be pleased with; and his field will, in a few days, assume a verdure superior to that afforded by any other grass, especially if the soil is moist, or if, on a dry soil, a small rain should chance to fall.

When the farmer intends to save the seed of this grass, I would by all means advise him to transplant as much of it as he thinks proper into a plot, where the soil is not too dry nor too moist, and is in good heart, either naturally, or by the addition of a reasonable quantity of manure. Let him place the plants in rows, about one foot, or better, fifteen inches distant from each other, and about eight inches distance in the rows. Let him keep this plot quite clean with the hoe: this will besides afford the plant a new stock of food, of which they require a large proportion when they are suffered to ripen their seed.

Timothy-grass is sweet feed for any sort of cattle, and the farmer will, in particular, find it greatly to his advantage to mow it for green fodder for his cows in spring: it will increase their quantity of milk, and besides improve the quality of it.

Fig. 3. in the same plate, is Mr. Rocque's burnet, with the seed ripe, notwithstanding which the stalks are succulent, and the leaves full of verdure, not being in the least withered or dried. The leaf of this burnet is longish, terminating nearly in a point, and deeply jagged or indented on the edges, the indentures being in form somewhat like the teeth of the balance-wheel of a watch. I must own, however, that I found some plants with a rounder leaf, and with smaller indentures: this I take to be a variety of the same species. The specimen I send is not of the largest size; for when the plant is situated on a kindly soil, it is much more luxuriant, and of course much larger.

It was the latter end of last month I was at Mr. Rocque's, where they then shewed me a second crop of burnet feeding, the first being, I suppose, though I forgot to ask, cut for hay.

Fig. 4. in the above-mentioned plate, is the bird-grass, or, as some call it, the fold-mead grass *.

This grass is, I am informed, a native of America, and loves a light loamy soil. It received, they say, its name of bird-grass from a singular circumstance: when the Americans first sowed this grass, and it was feeding, on coming to the field, they found in it many birds they had never before seen, the names of which they knew not: these birds left them as soon as the grass had done feeding, and were seen no more that season, but failed not to return the ensuing year at the same period: this induced them to call it bird-grass.

This is a very fine sweet grass, and makes most excellent hay, Mr. Rocque shewed me some of it dried, and it is almost impossible to describe the fineness of its colour and the sweetness of its smell: it really exceeded, in both respects, any meadow-hay I ever saw.

The

* Fowl-meadow grass also.

The specimen, of which Fig. 4. is a representation, is not of the largest size; for on good land it will grow to the height of at least three feet. It is a singular grass, the branches pushing from the main stem in alternate bunches, but, upon the whole, makes a beautiful appearance.

On the 20th day of September last, Mr. Rocque sowed some bird-grass, which in the spring he transplanted, and it is now in fine order feeding. This grass has a very remarkable property; for, on being transplanted, it soon thickens on the land, sending forth new shoots from every joint of the root; and when you take up a plant, you may separate it into as many parts as it has stems, each of which, if it has any root, will grow, and soon spread in a surprising manner. When I was last at Mr. Rocque's, I saw a plot which was just transplanted in this way: the plants seemed to stand about six inches distance in the rows, which were about a foot asunder; and this is the method I would prescribe to the farmer when he means to save the seed of this grass. The broad-cast way of sowing is, however, to be recommended when it is intended either for a crop of hay or for feeding. The quantity of seed should, I think, be about six pounds for an acre.

The orchard-grass, of which I also send you a specimen, Fig. 5. Plate I. has the peculiar property of thriving in the shade, and even under the drippings of large trees, so that I conceive it received its name from its growing under apple-trees in an orchard.

This grass loves a moist soil, and will grow to a large crop. It is exceeding sweet feed, and cows are particularly fond of it. Mr. Rocque told me the other day, that a cow by accident got into his orchard-grass, where she rather seemed to devour than eat it, for as far as she went she eat it close to the ground, leaving not a single blade behind her. The seed of the orchard-grass is ripe the latter end of June; and about five pounds will be sufficient to sow an acre, for it is a luxuriant grass, branching and
spreading

spreading a great deal, and growing to the height of about four feet when feeding.

If by any accident the timothy-grass should not take on a farmer's wet land, I would by all means advise him to try the orchard-grass, which will be very proper to supply its place, though I am apt to think it will not bear so much wet as the timothy-grass.

I hope, gentlemen, you and your readers will take in good part the contents of this letter, and that it may, in some sort at least, contribute to improve the state of our national agriculture. The farmer may, with the assistance of the figures engraved from the specimens I now send, be enabled to judge whether he is cultivating the true sorts of grass he would wish to stock his land with, and will be acquainted with the form of the several kinds of new grasses, even before he has seen them growing in a natural or cultivated state.

The specimen I send you of the timothy-grass is not of the largest size: Mr. Mills in his Fifth Volume, page 358. and in the Appendix to his Third Volume of Husbandry, says, that he has in his possession an ear of Mr. Rocque's timothy-grass, six inches long; to which I the more readily give credit, as I saw several ears myself, at least that length, in Mr. Rocque's grounds.

I am, GENTLEMEN,

London,
July 3, 1765.

Your humble servant,

CIVICUS.

N U M B E R X.

On Cone, or Blue-Ball, Wheat.

GENTLEMEN,

HAVING observed in one of your correspondents letters (see Vol. IV. page 90.) a desire to know the cone-wheat, I have herewith presented you with some ears thereof, being a specimen (see Fig. 8. Plate I. of this Volume)

Volume) of the growth of 1763, and therefore not so bright in colour as in good harvests.

I have sent the straw, or stalk, at its length, as left after reaping, it being cut about a foot from the earth*.

This is what is called cone-wheat; but its name, as known by us in these parts and Somersetshire, is blue-ball, from the dark colour on the edge of the husks of chaff, which cover each berry, and the falling off of the awns when ripe; some of the ears which accompany this being with awns, and some without, to shew the difference, though of one sort†.

RURICOLA GLOCESTRIS.
L.

N U M B E R X I.

Reflections on the Tendency and Consistency of some late Letters to the Editors of the Museum Rusticum, &c.

GENTLEMEN,

SOME late letters to you appear to me inconsistent with each other; and therefore it seems desirable that their respective merits should be ascertained, that the public may know how far they deserve to be regarded in practice.

The first letter on which I shall make reflections, is that from the *Old-Fashioned Farmer* on adding farm to farm, Numb. I. Vol. IV. This writer has for his basis an obvious truth, viz. that the adding of farm to farm to a considerable amount, namely, of many hundred pounds *per annum*, especially if these farms are kept chiefly in grazing, is detrimental to the nation in general. But this *general truth* is alloyed.

Some

* The straw, or stalks, of the specimens sent us by this correspondent, were, as well as we can judge, (for they were much broken in the carriage) near four feet in length. E.

† We had only room for one specimen. E.

Some of you, gentlemen, have justly observed, (in note * page 1. of your fourth Volume) that he is blameable for calling the practice of gentlemen, who let *many farms to one person, infamous*. It is in general *hurtful to the public*, and it is to be hoped that when gentlemen perceive it is so, they will not think any thing can be *advantageous* to themselves in the long run, which is hurtful to the public, with whose welfare their own is *essentially* connected. In the mean time such gentlemen have many things to say for themselves, and, in some particular cases, *unanswerable things*; and there is no probability that they will be easily converted from the practice.

Again, gentlemen, you rightly observe, (in note * on p. 2. Vol. IV.) that every necessary of life is dearer than it was twenty years ago; that twenty *per cent.* is a large advance: what then must we think of *cent. per cent.*? Still further, some of you, gentlemen, most justly observe, (in note † page 2.) that the Old-Fashioned Farmer contradicts, but without any shew of proof, the current opinion, which you rightly embrace, that enclosing is of public benefit, makes corn cheap, and increases the number of inhabitants, if the enclosures are kept under tillage.

And I may justly add, that uncultivated ground enclosed is *naturally*, and *almost necessarily*, kept in tillage some years; and if it is then laid down to grass, it is generally in order that old mossy ground may be ploughed out: at least this is the case in *all* our newly-enclosed countries; and if it is otherwise elsewhere, the bad practice is to be ascribed to the *ignorance* or *obstinacy* of farmers or landlords, and is by no means essential to enclosing. They must be strange wrong-headed farmers, who will not keep ground in tillage merely because they have it not in common-fields, where they till it with disadvantage.

One of you, gentlemen, (in note * page 5.) also admirably observes, that in order to deduce any argument from the encrease of the poor-levy at *Birmingham* against adding farm to farm, he should have enquired whether more poor are maintained with the four thousand pounds than

than were maintained about twenty years ago with nine hundred pounds.

The Old-Fashioned Farmer should indeed have *enquired into*, and ascertained, many other things, before he could fairly conclude, from the encrease of the poor's-levy, the hurtfulness of adding farm to farm.

To justify this assertion, gentlemen, I will add to the number of your strictures on this writer, a few decisive ones.

I. To prove the *adding of farm to farm* detrimental to the nation in general, he instances the *advanced price of butter* within these twenty years.

You have rightly observed, that all necessaries of life are much advanced since that period; and therefore particular causes must not solely account for such advance, but general ones. But to proceed: he owns as many cows may be kept on the ground which makes one farm, as when it made many; and many reasons may be added why the butter should be better, *viz.* that great dairies have better conveniencies, &c. and also that more butter will come to sale, because fewer families, and consequently mouths, of the farmer's own people are to be fed with it; yet this gentleman assures us that less comes to market. Let us suppose the fact true in that part of *Warwickshire* in which he dwells. He assures us also, that the farmer's chief dependance is on his cheese; his *new-milk* cheese he must mean, for he adds, that the *selling butter would hurt his cheese*. By which words he must mean, that a man cannot make cheese of his *new milk*, or his cream, and butter too; so that the whole of our Old-Fashioned Farmer's assertion amounts to this: "In the part of *Warwickshire* where I live, the farmers think it *more advantageous* to make cheese than butter; therefore the price of butter is advanced; therefore the adding farm to farm is *detrimental* to the nation."

II. This writer says further, that, in consequence of making *cheese* rather than *butter*, *not half* the quantity of pigs are kept. Now, every body knows that the whey of

new-milk cheese is so rich, that it cannot fall *far short* of the nourishment which the blue milk and butter-milk of an equal quantity of new milk would give : and himself owns, that the price of bacon is only risen from three shillings and three shillings and six-pence, to five shillings and five shillings and six-pence, not nearly double ; whereas, according to him, it ought, on this cause alone, to have risen to six and seven shillings ; and, on account of the other causes, which advance every other article of life, to much more.

III. Our Old Fashioned Farmer saw that the cheapness of cheese, by the increase of quantity, would be objected as a counter-balance to the increased price of butter, and therefore affirms that cheese is rose from fourteen shillings and eighteen shillings *per* hundred weight to twenty-five shillings and thirty shillings. Now it might suffice any reasonable man to be answered, that in the space of twenty years, at which he states his accounts, all other things are risen in price *very greatly* ; and therefore he cannot ascribe justly the advanced price of cheese to the adding farm to farm. But he has himself assigned two *very sufficient particular* reasons for the advance of price in this article, so far as it seems not accounted for by general causes : one is, that the little farms made some cheese for sale, but not so good by far as the great dairies make, and this bad cheese kept down the price of the good ; but now the good is bought up by factors for distant markets : and the other is, that the farmer returns so much *per* hundred weight to the factor, to enable him to sell at an higher price. So that the whole damage which seems to arise to the nation from adding farm to farm, in *Warwickshire*, is, that the cheese, which supplies many distant markets over the kingdom, is much better made ; and that some frauds are committed betwixt the manufacturer and factor of this cheese, (as in almost all other articles) to give a pretence for an higher price than is reasonable.

IV. The Old-Fashioned Farmer has reason to complain, when a proper quantity of a large farm is not kept in tillage,

tillage, as grazing encreases the want of corn and men; and yet, where fewer hands are employed, less corn will be consumed, of course less will be wanted, and consequently the price less raised. But when he talks of a grazing farm of five hundred pounds *per annum* being managed by three servants only, he must surely be mistaken, especially if any considerable part of such farm be fed with milch-cows. No grazing farm can be supported without meadow; and the attendance on meadow-ground requires several hands, though not comparably with tillage.

His calculation, that a farm of five hundred pounds *per annum* would, if in tillage, require more than sixty servants, seems highly exaggerated: for, as no sensible man would keep a whole considerable farm in grazing without some corn for his family, the feeding out his cattle, and supporting his cows in spring; so no man of common apprehension would think of having a farm of five hundred pounds *per annum* in tillage. If the rent was high, it would pay ill; and if low, he would have more than he could manage.

V. This Old-Fashioned Farmer would reduce farms to fifty pounds *per annum*. He remembers that such were called *tolerable-sized* ones when he was young: but from his knowledge of present things, he must know that the price of land is so much raised in forty or fifty years, that what gave only twenty-five or twenty pounds *per annum* then, will give fifty pounds *per annum* now, or more. And who needs to be told, that agriculture is subject to so many disappointments, that men, though *industrious* and *sober*, are *continually* breaking on small farms, especially if they have families to bring up?

VI. In his attempt to conclude something from the encrease of the poor's levy at *Birmingham*, we are to take for granted, that *most* trades are *over banded*, as he expresses himself. But, if this be true, it does not follow from hence, that this *over-banding of mechanic trades* arises from discouragement of breeding up boys to agriculture: or, if

this be the case in *Warwickshire*, it is evidently not so in the greatest part of the *kingdom*, where the wages given to boys and girls in farmers places are such, that mechanics can hardly get apprentices.

Your correspondent Y. gentlemen, has sent you a long letter (Numb. LXXIV. in Vol. III.) to evince, that the profit attending *pasture* land is greatly beyond that of tillage. He confines himself, indeed, to his own neighbourhood of *Bury*; and so he ought to do; for the case is widely different in other parts of the kingdom, as I may hereafter shew in some particulars.

What is the tendency of such letters as these, but to *discourage agriculture*, and *encourage grazing*; when such discouragement of the one, and encouragement of the other, is manifestly *in general* detrimental to the public weal? Particular situations may make pasturage more *advantageous* and *prudent* than tillage; and it is not to be expected that many people will or can afford to sacrifice considerable interests of their own to that of the public.

If Mr. Y. is satisfied that this is his own case, he is authorised to prefer pasturage to tillage in his own farm, and even to advise his particular friends, whom he thinks in like circumstances, to a like management.

But why should he publish these sentiments, which may discourage agriculture in cases not like his, and can do little or no good, as men, who find that tillage does not pay their trouble and expence, will soon give it over?

The high price of servants discourages agriculture in this country, which is so proper for it: and the cry of every farmer, who knows how expensive good *tillage* is, will be, "I don't desire to plough, if I can raise my rent "any other way." The payment of corn-tythe in kind, which is a tenth of the manure, the seed, and the labour, as well as of the worth of the ground, is a terrible discouragement to tillage; and all public means to encourage, rather than discourage it, should be used.

The letter from your correspondent R. W. (No. XVI. of your Fourth Volume) is so sensible, gentlemen, that I do not wonder several of you solicit his future corre-

spondence as a particular favour. It may, however, deserve to be observed, that his two capital errors in husbandry are so *essentially connected*, that, if you remove one, you almost certainly remove the other. Persuade the *landlords* and *tenants* not to let their grass-grounds lie unploughed till they become *mossy* and *hide-bound*, and they will soon agree to *lay down* their ground which has been too long ploughed.

The farmers cannot manage both in tillage, and they will be desirous of making the utmost advantage of both, by giving rest where it is wanted, and taking of crops where they are offered without immoderate expence. Again: persuade the *landlords* and *tenants* that old worn-out land cannot give crops which will pay rent, and for culture, and they will lay them down, and necessarily tear out their mossy grounds: so that, at which end soever of the evil you begin *effectually*, you will soon root out both.

In order to lay down arable to advantage, it must be sown with proper seeds; and when this management is steadily pursued, it will have good effects on the subjects of the two former letters which I have examined in this address to you: for, if a man once finds that by ploughing out forty acres of *mossy* and *hide-bound* ground, and laying down an equal number of worn-out ground with proper seeds, he can gain, with *half the expence*, *double the crops* he could in the old way (which, I believe, is a moderate computation) he will be better content with one farm thus managed, than with an additional one of the same size in the old way; especially as he will pay only half the rent, assessments, &c.

Again: the man who inclines to keep *all* or the *greatest* part of his farms in pasture, because of the immoderate expence of tillage, when he finds, that by this change of cropping he manages at half the expence, will chearfully carry on tillage, so beneficial to the nation!

There is only one thing in the letter of your worthy correspondent *R. W.* which seems to want re-consideration, *viz.* that he does not appropriate particular grasses
to

to particular soils. He seems to think that the *timothy-grass* will thrive almost any where ; but experience seems to say, that it will suit only low moist soils * ; and that *saintfoin*, *trefoil*, or *lucerne*, must be the properest for high dry grounds.

Your correspondent G. B. thinks, gentlemen, that I have not *considered* the *difference* of a bladder and the various coverings of an ox's belly. (See page 91. of your Fourth Volume.) I assure him I did, and designed not to represent these teguments as perfectly similar. All I meant was to give *some similitude* ; and fact shews that I gave one *sufficiently exact* ; for every day's experience makes it evident that (notwithstanding the real difference betwixt the thin membranes of a bladder, and the various thick ones of the ox's belly) the confined air, without aid of any tube, vents itself through one orifice, made with a pen-knife, sufficiently.

I shall, gentlemen, always be ready to oblige any of your candid correspondents, to the utmost of my power, by answers to their queries ; and particularly Mr. Williams, the gentleman who requests me to send an account of the prices of things relative to husbandry, in the manner of that account given from *Hertfordshire*. (See No. XXXIII. of Vol. IV.) But I must give reasons why I should engage with reluctance in such an account. 1. The prices differ so much in places of the same neighbourhood, that it is impossible to be exact : one must confine one's-self to *generals*, and these really give little satisfaction. 2. I cannot see the great use of these accounts, unless a gentleman intends to *purchase* or *farm* in the country of which he inquires. The means of sinking enormous rates would be of real and singular use to the inhabitants.

I have not yet seen your last publication ; but I am told, that in it you request me to *perform my offer*, of giving you an account of the *new-invented seed-furrow plough* at *York* †. I have received this information, gentlemen, from the author of that plough, but in a letter which contains

* See Numbers VIII. and IX. of this Volume.

† See the note under page 219. Vol. IV.

contains such an expression, as *absolutely precludes* my examination of that plough, with any design to give it to the public by the *channel* of your *Museum*, or *any other*. In this conclusion I dare say you will agree with me, when I assure you, that in this letter he asserts, that "I have *publickly avowed* myself his *professed enemy* *." Though he is pleased to add much compliment to me, as a *scholar*, a *gentleman*, and a *clergyman*, yet, after such a declaration of the light in which he *unjustly* views me, I must shew that I had no title to any of those characters, if I could think of becoming his *judge*. If you, gentlemen, could have construed any thing I said, with regard to the *new-invented plough*, as an *avowal of enmity* to its author, you would not surely have requested me to examine the performance: so that the affront seems equally to fall on you, and

Your impartial correspondent,

East-Newton,

THO. COMBER, jun.

April 20, 1765.

P. S. Though I have heretofore differed in some points from *Ruricola Gloucestris*, yet I have so much candour as to be glad to own, that I think his letter to you, marked Numb. XLVI. in your Fourth Volume, is a most just and sensible critique on Y.'s estimate, in Numb. LXXIV.

of

* Mr. R.'s accusation must be grounded on some expressions of mine to you in a former letter, *viz.* that his plough *seems as complex* as its predecessors, and has not *been tried*. These assertions were grounded on an account of his plough in another monthly collection, *viz.* the Gentleman's Magazine, in which a writer declares, that Mr. R. in his description, has not given a minute account of the parts; and from the drawing there exhibited, it *seemed as complex* as any predecessor. A correspondent of the compiler of the Magazine assured him that it had not been *tried*; and I think Mr. R. himself afterwards owns, that it has not had a *full trial*. It was this *seeming state of obscurity* which inclined me to think of studying the subj^t, and giving you (if I could, and you desired it) a *candid and more exact* account of the matter than had yet appeared; and with your acceptance of my offer I should have complied, had not Mr. R. effectually stopped my mouth by calling me his *professed enemy*. COMB.

of the preceding Volume. Nothing can be *more rational* than his conclusions about the pernicious tendency of implicit regard to Y.'s estimate; and indeed *Ruricola's* objections to facts in this estimate seem *utterly unanswerable*. *Ruricola* observes, that after long and extensive experience he could never find "that two pounds *per* cow could be "netted *per annum*, pigs included." We have several large dairy farms in this part of the world; and, I dare say, all our farmers will avow that their profits, after the best management, fall short of this. What then must we think of Y.'s *four pounds per cow*, nett profit, especially the pigs excluded? How will Y. answer the reckoning *all* the hay sold, and the cows kept in winter without any? I doubt he must reform his estimate much more than he has done already.

I shall always have a pleasure in obliging the editors of the *Museum Rusticum*, and therefore shall think it *no trouble* to endeavour to procure from the clergyman in the west riding of this county an account of his culture of the *white clover*. Though I do not know him *personally*, nor even by *name*, I shall endeavour to gain satisfaction on this subject, by means of my friend and relation, who is a man of reputation, and gave me the account.

To evince still further my candour, gentlemen, I will not withhold my loudest praise of a letter, though wrote by one who has not, I think, used me handsomely. This is J. L.'s letter, page 194. Vol. IV. on the means of reducing the high price of provisions. I will venture to say, that a *more useful* piece has not, in my opinion, appeared in the whole course of the *Museum Rusticum*. Superficial observers may rest themselves in *engrossers*; but men of penetration will go much further. I cannot agree with you in your proposal to *lower* the bounty on corn. I entirely agree with J. L. that the trade is sufficient to maintain itself without any bounty; and that the giving any bounty at all, is making us pay a great advance twice, first to raise the bounty given, and secondly by the advanced price of corn. In this I speak for the *public good*
against

against my own private interest; for a large part of this estate being in corn, the higher the bounty, the higher the price of corn, and the higher the rents.

I cannot avoid adding, that superficial observers, who fix on *engrossers*, suppose a great crop the last year. Thus a famous justice in the metropolis, in his charge to a jury. Whereas the truth is, that last year's crops yielded very ill, as one of your correspondents has justly remarked; and here is no plenty in our country. To J. L.'s very sensible proposal to strike off the bounty on exportation of corn, I would add another, that every method be used to encourage tillage: then we shall have corn enough for *domestic use* and *exportation* without a bounty. Under *domestic use* I reckon the feeding of *cattle* as well as *men*; inasmuch that, though much more ground were in *tillage*, and consequently less in *pasture*, yet, if this was properly managed, we should have not only *corn*, but *flesh meat*, cheaper. Let the pastures which now bear little grass be ploughed out; let our meadows be improved, and grass-seeds sown with our corn, much in the manner prescribed by Mr. Rocque; and we shall have butchers meat cheaper, the wages of our *mechanics* and *labourers in agriculture* decrease, and commerce flourish.

April 22, 1765.

NUMBER XII.

Of the Nature of the Burnet cultivated by Mr. Rocque.

GENTLEMEN,

MAGO, in Numb. LI. page 227. Vol. IV. begins with decrying "mere disputation on its (burnet's) botanical name, which, when fixed, will be of *no consequence* to the farmers in this kingdom: what care they whether it is the *pimpinella sanguiferba* of Ray, or the *pimpinella* of Linnaeus?" Surely there is some distinction

VOL. V. No. 23.

I

10

to be preserved between pieces directed to the *more scientific* of your readers and the plain farmer.

My letter on the confusion of the names *burnet*, *saxifrage*, and *burnet-saxifrage*, had a *tendency*, and a *direct* one too, to the use of the farmers of this kingdom. I will, gentlemen, *fairly state*, and *justify*, to you, the *occasion* and *tendency* of the letter just mentioned.

The nature of the burnet cultivated by Mr. *Rocque*, and recommended by the society of arts, was become a *favourite* and *interesting* subject of conversation. It is well known that Mr. *Rocque* had given a very imperfect description of it, though he had said many excellent things of its *culture*. It was very natural for any lover of *agriculture* to enquire what preceding writers had said of this plant, its properties, &c. that one might judge by *united suffrages* of the probability of success in its culture, and persons desirous to promote its culture, if useful, might not be engaged in loss.

I had ordered Mr. *Mills's* System of Husbandry to be sent to me by my bookseller, and read it with *attention* and *candour* in all its parts, and particularly on *burnet*. I could not, however, with *all my attention*, learn what plant he meant by Mr. *Rocque's* burnet; and I really inclined to believe that he meant *saxifrage*. The uncertainty arising from this *palpable confusion* was more mortifying, as Mr. *Mills* avowed himself to give an account of this plant from Mr. *Rocque's* own instructions. I sat down therefore, and laid before the public, by means of your channel, this *distressful confusion*, yet with much civility towards Mr. *Mills*, and a wish that he would explain himself to the public's satisfaction. Men of understanding know, that "*nomina dant rerum cognitionem*;" and that this maxim holds true never more than in *botany*, in which oftentimes, for want of distinguishing exactly the different names by which different authors call plants, and their different descriptions, no knowledge of their properties can be gained; so that the interest of the *English* farmer was *ultimately*, nay *immediately*, concerned in settling a distinct

distinct knowledge of the names by which the celebrated *burnet* might be *known* and found *described*.

In summer I saw some young *burnet* in Mr. *Lancaster's* garden, which he assured me rose from some seed of Mr. *Rocque's*, and which he also assured me was not the *wild burnet*; and towards winter I desired a particular account of the progress of this *burnet* from Mr. *Lancaster*, which he gave with great candour, and I transmitted to you, (see page 357. Vol. III.) as very useful for the public, that the dispute, "what plant Mr. *Rocque's* *burnet* was," might be cleared up. Mr. *Mills* had assured us that the plant which Mr. *Rocque* cultivated was the *wild burnet*; and it appeared evident, from Mr. *Lancaster's* account, and the specimens which he sent, that Mr. *Rocque's* *burnet* was not that known by the name of *wild burnet* in the north.

In order to give due weight to Mr. *Lancaster's* account, I observed in a note, (page 357.) that Mr. *Lancaster* was of the same profession with Mr. *Rocque*, and an acquaintance of his; and that they had lived in each others neighbourhood many years: but how was this wounding Mr. *Rocque*? *Mago* says he is told, that Mr. *Rocque* is "a man of exceeding good character and substance," p. 231. Did I tell or insinuate any thing to the contrary? Surely no. I only said, Mr. *Rocque* has too much sense to be ashamed of, or deny, that he was gardener at *Myton*, and there acquainted with my correspondent Mr. *Lancaster*, who has since, as a friend, visited him at *Walham-Green*. I have an high opinion of Mr. *Rocque's* skill, and think the public much obliged to him, both on account of cultivating *burnet*, and many other useful plants; and I only wish, that he had originally given an account himself of *burnet* which might have precluded the sad confusion and contradiction which Mr. *Mills* has introduced into the subject.

Another reason for my observing that Mr. *Rocque* had lived in *Yorkshire*, and near Mr. *Lancaster*, was, that he must probably know what we call *wild burnet*; and it is therefore more surprising that he should give Mr. *Mills* an

account of *his burnet's* being the *wild burnet*, while it disagrees so plainly from our *wild burnet* in an essential circumstance, *viz.* its being *ever-green*; a circumstance which should chiefly recommend *it* to the farmer.

Our gardeners in the north know nothing of *burnet* (as far as I can find) being an *ever-green*, and a *pot-herb*, and *fallad*.

Mago advises me to buy a pound of Mr. *Rocque's burnet* and make an experiment. I have got some of that gentleman's *burnet*, and intend to try it on several soils. But *Mago* might have known, that last summer, when I wrote the letter about the *confusion of names*, none of Mr. *Rocque's burnet* could be got; and I was obliged to judge of it by writings on the subject, and by the single small specimen which Mr. *Lancaster's* garden afforded.

Mago seems to entertain sanguine notions of the *important subject*, the *cultivation of burnet*, being fully cleared up by the experiment to be made at the *Grange*. I have a high reverence for the nobleman under whose auspices the experiment is to be made: but I must still think that experiment can only go as far, in the way of *induction*, as one experiment of many: and, though *Mago* would represent me as unfriendly to Mr. *Rocque*, I must declare, that I think that the experiments *related* and *vouched* by Mr. *Rocque* in your last publication are *sufficiently decisive*.

I have in a letter addressed to you, gentlemen, some time ago, observed, that what your correspondent *P. H.* says of *burnet*, may be true of the *wild burnet*, and not of Mr. *Rocque's*. This has *Mago* also observed, in page 230. and, since he saw the *necessity* of distinguishing these two sorts of *burnet*, in order to preserve Mr. *Rocque's* from *groundless imputation* and *discouragement*, he should have been more candid towards me, who only wished to have the subject *fairly cleared up*.

I am, GENTLEMEN,

Your old and impartial correspondent,

East-Newton,
April 22, 1765.

THO. COMBER, jun.

P. S.

P. S. Mr. Rocque's using the expression, "*this burnet*," &c. (see page 186. of your Fourth Volume) seems plainly to shew, that he understands *his burnet* to be different from the wild burnet, which does not grow *all* the winter.

NUMBER XIII.

Some further Observations on the various Species of Burnet, and other Grasses, especially Saintfoin and the Carexes; and Cautions about Sowing and Transplanting of Lucerne.

GENTLEMEN,

YOU have done an acceptable service to your readers, by giving them copper-plates which exhibit good delineations of several grasses; and I have too much the interests of agriculture at heart to wish that you should have taken any of them from my specimens, when you had better. However, the inferiority of my specimens did not so much proceed from their being gathered *northerly*, as from their being gathered *too soon* or *too late*, or in worse ground than ordinary. As a sufficient proof of this, I need only alledge, what is truth, that I have since found much better specimens of almost every species. The conclusion you drew was, however, *very natural* and *probable*. One would be tempted to think that the subject of *burnet* should be almost exhausted; and yet I am of opinion, (with one of your correspondents) that many of the disputants about this plant mean very different species of it; and therefore it is no wonder that they do not agree in their accounts of it. Those who speak against *burnet*, seem to mean the *wild burnet*, which grows with us very commonly, and which *certainly* always dies before winter; whereas Mr. Rocque's *certainly* continues green through winter.

You will therefore, gentlemen, do another very agreeable service to the public, I dare say, if you will give us
as

account of *his burnet's* being the *wild burnet*, while it disagrees so plainly from our *wild burnet* in an essential circumstance, *viz.* its being *ever-green*; a circumstance which should chiefly recommend it to the farmer.

Our gardeners in the north know nothing of *burnet* (as far as I can find) being an *ever-green*, and a *pot-herb*, and *sallad*.

Mago advises me to buy a pound of Mr. *Rocque's burnet* and make an experiment. I have got some of that gentleman's *burnet*, and intend to try it on several soils. But *Mago* might have known, that last summer, when I wrote the letter about the *confusion of names*, none of Mr. *Rocque's burnet* could be got; and I was obliged to judge of it by writings on the subject, and by the single small specimen which Mr. *Lancaster's* garden afforded.

Mago seems to entertain sanguine notions of the *important subject*, the *cultivation of burnet*, being fully cleared up by the experiment to be made at the *Grange*. I have a high reverence for the nobleman under whose auspices the experiment is to be made: but I must still think that experiment can only go as far, in the way of *induction*, as one experiment of many: and, though *Mago* would represent me as unfriendly to Mr. *Rocque*, I must declare, that I think that the experiments *related* and *vouched* by Mr. *Rocque* in your last publication are *sufficiently decisive*.

I have in a letter addressed to you, gentlemen, some time ago, observed, that what your correspondent *P. H.* says of *burnet*, may be true of the *wild burnet*, and not of Mr. *Rocque's*. This has *Mago* also observed, in page 230. and, since he saw the *necessity* of distinguishing these two sorts of *burnet*, in order to preserve Mr. *Rocque's* from *groundless imputation* and *discouragement*, he should have been more candid towards me, who only wished to have the subject *fairly cleared up*.

I am, GENTLEMEN,

Your old and impartial correspondent,

East-Newton,
April 22, 1765.

THO. COMBER, jun.

P. S.

P. S. Mr. Rocque's using the expression, "*this burnet*," &c. (see page 186. of your Fourth Volume) seems plainly to shew, that he understands *his burnet* to be different from the wild burnet, which does not grow *all* the winter.

NUMBER XIII.

Some further Observations on the various Species of Burnet, and other Grasses, especially Saintfoin and the Carexes; and Cautions about Sowing and Transplanting of Lucerne.

GENTLEMEN,

YOU have done an acceptable service to your readers, by giving them copper-plates which exhibit good delineations of several grasses; and I have too much the interests of agriculture at heart to wish that you should have taken any of them from my specimens, when you had better. However, the inferiority of my specimens did not so much proceed from their being gathered *northerly*, as from their being gathered *too soon* or *too late*, or in worse ground than ordinary. As a sufficient proof of this, I need only alledge, what is truth, that I have since found much better specimens of almost every species. The conclusion you drew was, however, *very natural* and *probable*. One would be tempted to think that the subject of *burnet* should be almost exhausted; and yet I am of opinion, (with one of your correspondents) that many of the disputants about this plant mean very different species of it; and therefore it is no wonder that they do not agree in their accounts of it. Those who speak against *burnet*, seem to mean the *wild burnet*, which grows with us very commonly, and which *certainly* always dies before winter; whereas Mr. Rocque's *certainly* continues green through winter.

You will therefore, gentlemen, do another very agreeable service to the public, I dare say, if you will give us

as good delineations of these two species as you have given us of other grasses: and to this end I send you specimens: that marked Fig. 2. Plate I. is a slip from a root of Mr. *Lancaster's burnet*, raised from Mr. *Rocque's* seed, and twice transplanted; once from Mr. *Lancaster's* seed-bed, at the latter end of last year, and again this spring from one of my gardens to another. That marked Fig. 6. is a sprig of our common wild burnet, which grows with us chiefly in low and marshy grounds, and both on the *ridges* and in the *furrows*; yet, I think, more on the former.

The heads of Mr. *Rocque's* burnet are now in full bloom, which is whitish, impregnating the feed; whereas the heads of the common wild burnet do not yet appear at all: but good engravings will make the difference in the leaves of these two species obvious to any common spectator's eye. Those of Mr. *Rocque's* are *smaller, shorter, broader, thicker set, and finer indented*. I may add, (what cannot appear without colouring) that the colour of Mr. *Rocque's* leaves is a much more bluish green than that of the common wild burnet. This I ascribe to the finer salts which are found in Mr. *Rocque's*, and preserve it from the rage of winter.

In my walk a few days ago, gentlemen, upon a down in this neighbourhood, I espied a small plant, which, on examination, appears to me to be a species of the *burnet*. I send a specimen, marked Fig. 7. You may, if you will, call it *Comber's burnet*. The heads are now in full bloom, and exactly resemble Mr. *Rocque's* in miniature. The leaves on the foot-stalks resemble those of his, both in form and manner of setting; but they are *much smaller*, and the shoots *much fewer*: circumstances which I ascribe to the extreme barrenness of the down, which brings only the smallest and poorest grasses.

A gentleman, who was with me in my walk, agreed with me, that this grass was certainly a species of the burnet; and that it is very common on the wolds in the east riding, where it is eaten by sheep, and all other cattle, so greedily, that none of it remains at the latter end of
the

the year. This I can readily believe, because I remarked, that though plenty of it is to be found in that part of the down which is unseparated from a corn-field, and where sheep are seldom watched, yet it is rarely to be found in the adjoining part of the down, where sheep generally go.

The soil on which I found it most plentiful, is as poor and hungry a gravel as can be met withal, and affords hardly any thing but a turf for walks, where the barrenness is a recommendation.

If I have *life, health, and leisure*, I design to transplant some of these roots into good garden-earth, and see what effect culture will have upon them; also to gather and sow some of the seeds*. I am sure, gentlemen, you will approve of this spirit of experimenting.

On one stalk of the root whence I slipped Fig. 2. I counted above a dozen heads advancing in different degrees to perfection; so that it is no wonder that burnet, well cultivated, should produce much seed.

The mention of my design of trying the effects of culture on this smallest species of burnet, reminds me of what I lately found asserted in some treatise of agriculture, viz. that *saintfoin* is so poor a grass in some parts of *Italy*, whence it is transplanted into *English* soils, that it is wonderful any one should ever think of cultivating it. I was much more surprised at this assertion, because the soil and air of *Italy* are represented as much more favourable to the production of herbs, plants, and trees, than those of *England*.

I have since observed, that one of your correspondents mentions his success in the culture of *saintfoin* in a place near which the wild *saintfoin* grew. This was the first hint I received of *saintfoin*'s being a native of *England*; and I could have wished, that the writer had added an account whether the *wild saintfoin* differs from the *cultivated*; and if so, in what respects.

On

* We approve much of Mr. Comber's intentions; and should be glad, at a proper time, to be made acquainted with the result of his experiments. E. R. O. A.

On the same day when I found the smallest kind of burnet above mentioned, I was informed by an ingenious young botanist, (the Rev. Mr. *Pierſon*, late of the same college with myself, *Jeſus-College* in *Cambridge*) that he has found *wild ſaintfoin* on *Gog-Magog* hills near *Cambridge*; and I underſtood that there is no material difference betwixt that and the *cultivated*; for he ſeemed ſurprised, as I had been, at the account of *ſaintfoin*'s being a deſpicable plant in *Italy*.

This laſt-named gentleman obſerved to me, that the graſs, which you and I called *nameleſs graſs*, (ſee Vol. IV. page 127.) is a ſpecies of the *carex*: and in this he is certainly right. I did not expect to find any thing of this kind in ſuch an *high* and *dry* ſituation as I picked my ſpecimen from. I have, however, found ſeveral ſpecies of this graſs ſince, varying according to their ſeveral ſituations of ſoils. The ſtrongeſt and nobleſt are thoſe which grow in marſhes overflowed and enriched by the mud of a river or rivulet which runs through rich grounds.

I ſend a ſpecimen, marked Fig. 9. which I apprehend to be a ſpecies of the *bents*.

I have ſown lucerne in drills, in order to tranſplant it in ſpring; for I find by experience, that there is little or no advantage gained by tranſplanting in autumn, as it is very difficult to catch the time which is neither *too hot*, nor *too much expoſed to froſts*. My late domeſtic affliction allowed me not either leiſure or thought for ſowing till the nineteenth of *May*; and my ſeed, which was recommended as good, comes up pretty well, though beſt where it was ſlighteſt covered; the little gravelly ſtones, &c. which will be left in ground which ſeems beſt prepared, being ſufficient to ſmother ſo delicate a plant as the riſing lucerne.

A worthy neighbour of mine, who ſowed ſooner and thinner, has his crop much more flouriſhing and *promiſing*. I covered mine with my hand, and yet I ſeem in many places to have covered it too deep. The drought ſince my ſowing has been continual, except ſome ſhowers about the

twenty-third and twenty-fourth of *May*; and as my young plants, just peeping, seemed to want refreshment, I gave it with the watering-pan, keeping the nozzle on. I did not form my drills with great regularity, as I did not apprehend I should have occasion to water them, which, I am now convinced, they want as much after the young plants appear, as they do *dry weather* for three or four of the first days after the seed is sown.

I was surprised to find the fine young shoots of my transplanted lucerne torn off, and lying in a withering condition at the foot of several of the plants. After an attentive examination, I perceived the slime of something of the snail kind on different parts of the plants, and by more attentive watching I found that the slugs were my enemies. They seem, however, to attack only the youngest and tenderest shoots of the weakest plants.

I have cleaned the rows of my transplanted lucerne by the hand, and hand-hoed the intervals. I find several of my plants, though fine ones, and transplanted in a fine moist season, (the twenty-sixth and twenty-seventh of *April*) dead. This destruction I ascribe to a want of watering; for I depended on the great moisture of the ground, which seemed sufficient to refresh almost any plant: but I have recovered some, which seemed dead, by good watering.

From this observation of my sown and transplanted lucerne, I am enabled, gentlemen, to recommend the following cautions in this yet novel culture.

First, Let the cultivator have his ground prepared, so as to sow as soon in *May*, or even in *April*, as the frosts seem gone, and that there is a probability of two or three dry days, to prevent the bursting of the seed by wet.

Secondly, Let him make his drills very shallow, and spread the seed, where it appears to fall too thick, with his hand, and cover it slightly with the same, taking away all the bits of stone, sticks, &c. which are likely to obstruct the rise of this very delicate plant. Or,

Thirdly, (which method I much prefer in theory, and shall hereafter practise) Let the cultivator, when he has

made his plot of ground as smooth as possible, make no drill at all, but only stretch a line, and holding the vessel in which the seed is (with a small pierced nozzle) close to the line, sow it very thin, and sift fine earth on the whole plot when it is sown, so as to cover the seed, but not deep; about a quarter of an inch I apprehend sufficient.

Fourthly, when the plants first appear, let them have, if they want it, water, and more fine earth sifted on to them.

Fifthly, I caution against weeding the rows very early; because the loosening the earth about the roots of this plant (very delicate and tender in its first stages) will infallibly destroy it.

Sixthly, When the rows are first weeded, great caution must be used, not to disturb the roots of the tender lucerne.

Seventhly, I advise a circle with foot or lime to be made about every plant of transplanted lucerne, (as about transplanted colliflowers, &c.) to prevent the access of slugs, &c.*

Eighthly, Let water be put into every hole at transplanting.

Lastly, When the hand-hoe is used betwixt the intervals, the rake should follow it, to drag out the weeds, and smooth the surface; but this rake should be narrower than the intervals, for fear that it should injure the plants in its motion to and fro.

I am, GENTLEMEN,

East-Newton, Your constant friend and servant,
June 8, 1765. THO. COMBER.

P. S. I endeavour to send this letter (especially as it contains specimens of grasses) by a *private hand*, to save you postage; a circumstance I am always attentive to, as you will acknowledge, when you see how many of my letters are come to you uncharged †.

* This, we apprehend, can only be practised where the quantity is very small. E.

† We are much obliged to Mr. Comber for this attention, but we never think much of paying the postage of our correspondents letters. E.

NUM-

NUMBER XIV.

On the Means of propagating the separate Culture of our Native Grasses.

GENTLEMEN,

ONE of your correspondents, who signs himself Clericus, (see Vol. IV. page 423.) after giving a botanical account of those grasses for which the society have offered premiums, says, "Could not the society have found other grasses worthy of being cultivated, at least as good as those for which they have advertised?" He thinks there are some others which equally deserve attention, but does not describe them, which I am sorry for, as this is the season wherein most grasses are in seed; and gentlemen, who are desirous of collecting all the best sorts, might thereby have been enabled to gather some of these he has a good opinion of, in order for sowing them separately next month, or in the spring of the year.

As I attended the committee to whom the society referred the consideration of grasses, I can venture to assure Clericus, that great pains were taken to find out all the different kinds and species which deserved cultivation; and so earnest are they in this pursuit, that I dare say they will consider themselves greatly obliged to him, or any other gentleman, who will point out to them any valuable grass, which has hitherto escaped their notice; and I hope the person who does them that favour, will, at the same time that he favours them with the description, send some specimens of the plant to their secretary or register, to prevent all mistakes.

Clericus's plan of publishing microscopic views of the different parts of the grasses in flower and in seed, may be a very good one; but I fear the difficulties he himself foresees will ever prevent its being carried into execution.

K2

Would

Would it not be better and easier for the society to make large collections of the plants themselves, in their flowering and seeding states, and distribute them over the kingdom by means of their members?

The flowers of the plant, it is true, could not easily be preserved, but enough of resemblance would remain to prevent error; for the appearances of the grasses they wish to propagate are so different, even in a dried state, that nobody can easily mistake them.

I must differ with Clericus about the value of the premium the society offers for gathering grass-seeds.

The quantity of clean seed which they require is very small. They never intended to employ gentlemen in a business so little suited to their character; but they thought five pounds a very high reward for a week's labour of a poor man; and they hoped that some such benevolent spirit as Clericus would take the trouble of instructing an honest, deserving, but indigent parishioner, in the way of distinguishing those grasses for which rewards are offered*.

I am, GENTLEMEN,

Your most obedient servant,

Clapham,

PHILO-GRAMEN.

July 2, 1765.

NUMBER XV.

On the Method of curing luxuriant Apple-Trees; with some Remarks on the Culture of Bere.

GENTLEMEN,

AMONGST some of our fruit-trees, there was one that never even produced so much as a blossom.

The soil of the garden is rich, tending to clay, and very moist, owing to its low situation. The tree is under a high southern hedge. These circumstances, as I imagined,

* We shall be glad to hear often from this gentleman. E.

imagined, caused this in particular to shoot so luxuriantly, that it never threw out any of those prolific spurs on which the apples grow.

I concluded, that to remedy the defect would be to put a stop to the too abundant flow of juices: accordingly, three Augusts ago, I cut off the tops of most of the shoots, slit the bark perpendicularly in different places, and with a saw cut the trunk about one third through, so as not to injure the heart.

Last year this tree produced several apples; but this year the appearance is past expectation; it was full of flowers, and not any wise injured by the north-west and easterly winds, which hurt the rest of our fruit.

The part that was sawed is grown up, and not to be discerned, excepting by the newness of its bark.

From the slitting I find a still further benefit. When there is a superabundancy of moisture, the trees are liable to be covered with moss: every one knows the bad effects of it on every kind; but this in part cures it, especially if the moss at the same time be scraped off, or rubbed with a coarse wet cloth.

Most of the apple-trees in the garden have been so managed; and, not to speak unreasonably, I find great advantages to flow from it. It both encourages the growth, and helps to destroy the moss; for its fibrous roots striking into the mouths of the *tracheæ*, or air-vessels, must impede the circulation, as much as an impure, or too little respiration, must cause disorders in the human body.

The pruning of the tops diverts the channel of circulation, and makes those fruit-bearing shoots to grow.

Cutting the body a-cross, moderates the great rise of nourishment or sap; for I imagine, that in the junction again, several of the vessels must be rendered useless by not joining together, and that the vessels are smaller in their diameter; but, as I am not as yet furnished with glasses, have not been able to satisfy myself in that point.

Through

Through all this country they grow a great deal of bere, but little of the two-rowed barley: it is mostly shipped off for malting, and is (as they term it) reckoned to give kindly.

This bere labours under a disadvantage, in not being thoroughly cleared of its auns or beard. This is imputed to carelessness in cleansing it, or preserving it from moisture in the stacks. But I find, that all the labour they can possibly give, will not answer; nor is it so much owing to the manner of keeping, as far as my observations inform me, as to its not being thoroughly ripe.

I advised it to be sooner sown, and was informed that it answered better than formerly. This method I could wish was adopted by those gentlemen who grow that grain.

An accident has made me think there might be improvements made in its cultivation.

Amongst some wheat that was sown last year, a small quantity of bere happened to be mixed, all of which bere is now in the ear, and in the most flourishing condition I ever beheld: even this long and easterly wind has not in the least affected it, and we may expect it to be ripe very soon. I could earnestly desire some of your readers to try this experiment, and shall endeavour to have it done myself*. There are many of your readers would be glad that this grain had a better character, as to its cleanliness; and I am persuaded it would come into great esteem every where; still remaining a well-wisher to the undertaking, and,

GENTLEMEN,

Your most humble servant,

Wigton, in Galloway,

J. M. C.

June 7, 1765.

P. S. I would have given you a state of agriculture in the Isle of Man, according to your request†, before this

* In Ireland great quantities of bere are annually sown in autumn, and it yields large returns. E.

† See Vol. II. of our work, page 142.

this time; but really, by being silent, I tell the whole, though I imagine, since the late act discouraging smuggling there, there will be more industry, less perverse ignorance, and better farmers*.

NUMBER XVI.

On the fatal Effects of Ground-Ivy, when eaten by Horses.

GENTLEMEN,

AS it is the case frequently for many horses to die without any apparent cause being assigned, I intend in this paper to give some account of the fatal effects of horses feeding on the herb *gill-go-by-the-ground*, *allhoof*, *ground-ivy*, or *hay-maids*, alias *hedera terrestris*.

In the stubble fields in the latter part of summer this plant is most plentiful, and also most pernicious; because at this season it is at its full growth, and in its greatest perfection; and at this time horses are most frequently put where it grows, (which is in the greatest plenty amongst peas, beans, and barley-stubble) in order to eat off the grass and weeds before such land be again ploughed for a crop of wheat.

In my own family, and amongst my acquaintance, I can remember seven or eight that have died by eating this plant within about ten years; from which I was induced to apply myself to find some remedy, but can hitherto discover none; though, the better to attain such knowledge, I have carefully examined the contents of the *thorax* and *abdomen* of this creature after dying by eating

* As this gentleman seems to be an inhabitant of Scotland, we should esteem it as a particular favour if he would, at his leisure, give us some information respecting the state of agriculture, and the methods of practice, in that part of the united kingdom: we are the more urgent in this matter, as we know that great improvements have been of late years made there both in agriculture and manufactures. E. N.

ing of this herb, the appearance of some parts of which I purpose to describe, as it was preternatural, in hopes that some person, more observant of the diseases of this useful animal, may be induced to point out a probable or more certain remedy.

I have carefully perused many antient and modern authors, who have wrote of the diseases of horses and beasts; but can find nothing on this head.

A strong cart-mare, rising seven years old, in good plight, was put to feed in a peas-stubble field, soon after the peas were carried, and amongst which a great deal of this plant grew, where, after about a fortnight, she was observed to be unwell, by her standing near the hedge in a sleepy posture, and fetching her breath with much difficulty, frequently heaving as though she wanted to dung.

There was no sign of any cold taken, nor a cough to be perceived, from which it was concluded a stoppage was the case.

A farrier was sent for; who gave her something to relieve the apprehended complaint; but after the drink given, the symptoms became more violent, and the heaving, as though she wanted to dung, was almost constant: the muscle which contracts the fundament lost its use, and that part became quite open, insomuch that one might see distinctly a considerable way into the gut. An acute pain did not seem to trouble the creature; but short breath and constant heaving were the symptoms which appeared; and in this condition, after about twelve hours from her being discovered, she died.

I had her opened, and on examining the (*thorax*) chest, I found the heart larger than is common for horses of equal size; the lights very full of blood, and greatly swelled, so much, as to fill the cavity, and they were of a livid colour, as though near putrefaction, yet not rotten. In the (*abdomen*, or) lower belly the liver was nearly of the usual size, or rather less, but of a livid colour, inclinable to green. The gall-bladder was nearly empty: the stomach a little (inflated)

(inflated) filled with wind ; but in it was very little more than the drench which had been given, except some small matter of food, part of which had somewhat the appearance of the plant which is apprehended to have caused her death ; but the smell of the drench had the ascendancy.

The small guts were empty in general, but in the flexures (folds) of the *colon* some visible parts of the ground-ivy were met with, and its smell perceptible ; from which a conclusion was made, that it was the cause of her death, since no marks of violence any where could be discovered.

Since this time I have been somewhat particular in enquiring into the state of other horses apprehended to die from the like cause, and have understood that their insides were much as this described.

If this plant, as has been for a long time, and is still supposed, be the cause of the death of horses which feed on it, (and, I am very apprehensive, on good grounds too) and be unknown as to its effect on this animal ; I think it may not be amiss to propose the following queries for the consideration of the ingenious and observant in the nature and quality of our British simples ; as,

I. What should be the cause of this herb being fatal to horses only ; since it is so frequently recommended, by the learned in the healing art, to people of consumptive habits, as well as drank in the spring of the year, in many forms, as a purifier of the blood ?

II. What vegetable, or other medicine, may be its antidote, with respect to its ill effects on horses ? And,

III. What should be the cause of the shortness of breath, and constant motion to dung, for some hours before the horse dies ?

If the foregoing be thought worth a place in your publication, let it appear, and it will oblige

6, — 13,

65

RURICOLA GLOCESTRIS.

L.

NUMBER XVII.

On the Culture and amazing Produce of the African Millet.

GENTLEMEN,

I Cannot help mentioning to you, for the sake of your practical readers, the African millet, *sorghum*, *milium nigrum*, the culture of which is strongly recommended by M. Tschiffeli, who has written a paper on the subject, published in the Transactions of the Berne Society. There is something so very extraordinary in this paper, that I am sure you will think a short abstract of it worthy to be inserted in your work.

Monf. Tschiffeli observes, that this millet is a plant which merits the husbandman's utmost attention, and that for the following reasons:—1. It thrives in all sorts of soils.—2. It neither requires much dung, nor a great deal of tillage.—3. It is not subject to the depredations of birds, which are very fond of panic and common millet.—4. It yields very large returns.—5. Lastly, it does not exhaust the land in proportion to the largeness of the crops.

He farther says, that the seed of this sort of millet comes originally from Africa, where it supplies the inhabitants with food; but that they are mistaken who thence conclude it will thrive only in hot countries: for providence has endowed it with such excellent qualities; that it may, with success, be cultivated in countries much colder than Switzerland.

The first seed of it M. Tschiffeli received was from Mr. Engel, magistrate of Eschalens, who procured it from Pomerania, it being sent to him by the celebrated Doctor Schreber, in the spring of the year 1760. M. Tschiffeli had from him about a spoonful.

In the month of May of the same year, he sowed it on a gravelly soil, hard and stony, very much exposed to the north wind, and which the year before had borne some very indifferent bere. In the month of February preceding, some human ordure had been laid on this land; and in

May

May the clods were all broken before the seed was spread: having so small a quantity of seed, he took care to spread it very thin; and to this does he ascribe the stalks running to the height of eight feet or more. The ears were above ten inches long; and if a shower of hail had not fallen on it, the spoonful would probably have produced him at least a peck. This accident occasioned the loss of half his seed: he had, however, enough left to divide with his friends in Switzerland, as well as elsewhere.

In the month of May, 1761, he sowed about a quart of seed, or near a pound, on some land, from which he had first pared off the turf, and afterwards burnt it. The space on which the seed was sown might be about twenty paces long, and ten broad.

Some time before harvest, M. Tschiffeli perceived he should have allotted three times as much ground for that quantity of seed. The stalks, which were very close, were interwoven one with the other, like the hairs of a brush. They were scarcely five feet in height, and the ears also were much shorter than the preceding year: this, however, did not prevent his reaping about seven pecks, or above fifty for one. In the year 1762, he sowed about four pounds of seed, or about half a peck, on some pretty good land, being in quantity about thirty square rods or perches. The year before, the same land bore potatoes; and as he had laid on no fresh manure for the millet, and had neglected to plough it before the winter, (for it was only turned over with a spade before sowing) he imagined he had not sown the seed too thick: but in this he was greatly mistaken; the millet came up almost as thick as the year before, and as he had not the courage to thin it, which would have been right, the stalks and ears were shorter than the first year.

Notwithstanding this, he was enabled to reap twenty bushels, being six hundred and forty pounds; of course, a return of an hundred and sixty for one.

There can then be no reason to doubt, but that land of a moderate quality, sown thin, and properly prepared, will produce, one year with another, one hundred bushels of millet *per acre*; for our husbandman got as much in pro-

portion, though his land was but slightly tilled, and he manifestly sowed his seed too thick. This is certainly a most wonderful increase, in what light soever we behold it.

What grain is there which in the open field will yield a return of one hundred and fifty for one, and which, at the same time, will sell so well, for in price it is on a footing with wheat? It is true, it yields a heavy, crumbly, and indifferent bread; but if it is made into pottage, it is excellent, very nourishing, and of exquisite flavour. Not only M. Tschiffeli's servants and workmen were very fond of millet thus prepared; but he himself prefers it to the best rice, which will not grow in Switzerland, and comes at a much higher price.

The millers in Switzerland, whose reputation is not of the best, return a good third of a bushel of millet-meal for every bushel sent to them, after deducting toll, bran, waste, &c. Now this ingenious writer knows by experience, that such a quantity, when made into pottage with milk, will serve at least fifty men for a meal. Surely they cannot be fed at a cheaper rate. In times of scarcity millet must be of great use, as with potatoes the poor might live comfortably.

An acre of land requires, at most, but ten pounds of seed; and M. Tschiffeli says he can, from his own experience, venture to assert, that millet does not impoverish land in proportion to its produce. The land he sowed in 1760 and 1761, yielded, the following year, fine plants of Dutch clover, and rye-grass in as great plenty, with respect to the crops, as the neighbouring land.

This intelligent husbandman, to whom Europe is so much indebted for his patriotic endeavours to improve the state of husbandry in Switzerland, and of course in other places where the memoirs of the Berne society are read, with a spirit becoming himself, offers to supply such of his countrymen with this seed as cannot afford to buy it; and I have not the least doubt but that he would with pleasure send over a parcel of it to our London society, if the committee of agriculture should think it an object worthy of attention. This committee I have frequently attended; and I have so good an opinion of this African millet, that

I have some thoughts of recommending it to their notice, when the meetings of the society shall commence after their present recess. A translation of the above piece was some time since published in the Foreign Essays on Agriculture and Arts: this I mention that it may not be said my abstract was stolen: I shall always with pleasure acknowledge the person to whom I am indebted for even a single idea. I should be glad to be informed whether common millet is cultivated in any part of England; and if it is, in what county, and what are the methods of culture to be pursued, as I could like to sow some next year.

I am, GENTLEMEN,

Middlesex,
July 5, 1765.

Your very humble servant,
S. BURTON.

NUMBER XVIII.

Some Remarks, by the Editors.

WE have lately received from one of our correspondents a private letter, which he signs with his real name: it contains a kind of criticism upon our work.

This writer says we should never admit any thing of theory into our collection; and that many of the pieces contained in it are trite, and on well-known subjects. He complains also of extracts from antiquated and foreign authors, "in their day," adds he, "and to them, very useful, but of little benefit to us." He says, that some of our very knowing correspondents, who contributed to divers of the first Numbers, have of late declined their contributions; and that the number of our purchasers will decrease, if stricter regard be not had to the original plan.

It may be proper in this place to observe, that we have, within a few months past, received one or two other letters on nearly the same subject, complaining that our work was more calculated for the reading of the common farmer than the gentleman of education and intelligence; and that even
the

the experienced farmer found many things in our Numbers which he was before very well acquainted with.

We are sorry to say, that the first-mentioned writer seems much disposed to find fault with one of our correspondents, whom he calls a large contributor, and to whom he will allow no knowledge resulting from experience.

We cannot be mistaken in the person he aims at; and it would be injustice if we did not, in this place, observe, that many of the communications of the gentleman alluded to are truly valuable; and we may venture to say, that all of them merited insertion in our work.

Our readers well know we do not give too great an encouragement to theory; yet without theory there can be no improvement in any science or art; for what is the idea of an improvement, before it is reduced to practice, but theory? and this is the kind of theory we would wish to encourage. Many men may suggest improvements, who have neither leisure nor opportunity to make experiments. If it had not been for Mr. Wyche's theory of burnet, the practical culture of it would never have been undertaken by Mr. Rocque.

That the subjects of some letters may be trite, and on matters well known to the more intelligent part of our practical readers, we acknowledge; but it does not follow, because these things are known to some, that they are known to all. We must once more repeat, that the principal intention of our work is to convey useful knowledge to the common farmer; and, to be of service to him, we must endeavour as much as we can to promote the circulation of useful practices from one part of the kingdom to the other. If the Cornish land-holder has any piece of knowledge that conduces to the encrease of his annual profit, it is our desire that this should be communicated to the Yorkshire and north-country farmer, &c. who, under the same or like circumstances, will be in a manner sure to reap the like benefit from the practice.

Though our principal care is to instruct the common farmer, yet do we by no means forget the country gentleman;

man; of which the impartial reader may be fully satisfied by turning over the Four Volumes we have already published, wherein he will not fail finding many pieces curious enough to engage the attention of the most learned. We may add, that we never yet heard of any purchaser who grudged the price he paid for any single Number; for the question being put to many, they all candidly acknowledged, that they always found in every Number something which they would not, for the sake of several times the price, have failed reading.

We know full well the value of the pieces sent us by the gentleman who wrote us the first-mentioned letter; yet have we by several correspondents been told, that he knows nothing of farming; that he writes from theory alone; and that his letters had better be omitted: yet we, who are better informed, take no heed of such counsel. We mention this to shew that it is an easy matter for people to err in their judgment, particularly if they suffer themselves to be influenced by partiality.

We have very few extracts from either antiquated or foreign authors; and such as are to be found in our work are universally acknowledged to be highly useful.

We do not know that we have lost any of our best correspondents, unless they are said to be lost, who have since ceased to live. Mr. Wyche was, with pride we say it, a great friend to our undertaking; he is dead, and the lovers of agriculture will long lament his loss. We need only refer to our Third and Fourth Volumes to convince this, or any other gentleman, that the correspondents who now favour us from time to time with their communications, are able, intelligent, experienced, and knowing.

If we mistake not, we have always had regard to the plan we originally laid down; and to this do we attribute the hitherto continually encreasing sale of our work: to this are we to ascribe the purchasers of it becoming every day more numerous, and that a Third Edition is now printing: this is also the reason why it is at this time actually circulated over France, Flanders, the United Provinces, Germany,

Germany, Sweden, Denmark, Silesia, Poland, North-America, the East and West Indies; and some are even sent to Russia, where great encouragement is given to agriculture.

A still farther proof of our collection containing pieces truly curious and useful, is its continually supplying almost all the news-papers and magazines with matter for the entertainment of their readers. The articles contained in our work are published and re-published in various forms and shapes; and our correspondents are frequently made to address themselves immediately to the printers of news-papers, or the compilers of magazines; for they would fain persuade their customers that the pieces were originally written for their use; to effect which purpose they have sometimes even altered their dates.

When agriculture is so far improved, as that farmers are in general acquainted with the good methods of husbandry practised in all parts of the kingdom, it will then become necessary for us to confine our work to improvements only; but as that period seems to be far distant, it is yet incumbent on us to propagate, as much as possible, any useful piece of knowledge that is communicated to us, though some of our more knowing readers may possibly have been long acquainted with it. The same may be said of foreign practices, where there is any probability of their being useful in any of his majesty's dominions.

Our desire is to please; but we are not so inexperienced in the concerns of life, as not to know that "it is impossible to please every body." The public encourages our work by becoming ready purchasers; and we have the pleasure to know that such of our brother members of the society for the encouragement of arts, &c. as read our collection, approve of our endeavours. With this encouragement, and this approbation, we are abundantly satisfied, though some few may chuse to cavil.

Museum Rusticum, &c.

For A U G U S T, 1765.

VOLUME the FIFTH.

NUMBER XIX.

A Letter from the Old Essex Farmer, in which he gives his Opinion relative to the Education of a Youth intended for a Farmer.

GENTLEMEN,

BE not surprised that the old man should still have life, health, and spirits, once more to address you: he earnestly wishes to be of service to posterity, and knows of no method so proper as that of communicating to the public his sentiments on the subject of agriculture through the channel of your very valuable collection.

Many of your readers will probably say I am too fond of theory: that I am fond of it is certain; but it is of that kind of theory which immediately leads to an improved practice; that theory without which no improvement can be made (I know, gentlemen, you are of my mind in this matter); finally, that theory which constitutes the life, the spirit, the very soul, of agriculture.

VOL. V. No. 24.

M

It

It is not the want of having a knowledge of practice that makes me fond of theory: I have been, as I before told you, many years a practical husbandman; I have derived from this practice almost all the happiness I have enjoyed, and to it do I owe the improvement of my fortune: who then will presume to call me, by way of reproach, *a man of theory?*

In one of my late letters I think I mentioned an expression I have frequently heard used, namely, that *any fool may make a farmer*. Had the celebrated Dr. Browne been living, he would doubtless have recorded this as a vulgar error; and a very great error indeed it is, as I shall endeavour to make appear before I conclude this letter.

I also promised, if God spared me health and spirits, that I would give you my sentiments with respect to what education a youth should have who is intended for a farmer; this task I shall now endeavour to perform.

I do not, gentlemen, arrogate to myself any particular merit; yet have I, perhaps, entered more into the spirit of farming than most of my neighbours within forty miles round me; and if I have met with any success, which I undoubtedly have, I owe it, under God, to the excellent education bestowed on me by my father. This being the case, I think it cannot be thought digressing from the subject, if I acquaint you with the manner in which I was brought up, particularly as I mean, with great candour, to point out wherein my education was deficient.

Before I proceed, it may not be amiss to observe, that I am far from recommending my education as a pattern for farmers to follow with respect to their sons, because I am conscious it would be by much too expensive: no; I mean to lay down for their use a plan which will answer all useful purposes, and cost but little.

I was, gentlemen, at a very early age taught to read; and was made to know the value of numbers long before most children have any idea of them, inasmuch that at the age of ten years I knew more of figures than many men
do

do who carry on an extensive trade : this was partly owing to the assiduity of my master, but more to a natural inclination and desire I had to excel my schoolfellows in this matter and writing ; for at this time I had a detestation to Latin, though I spoke and understood French as well as I did English.

My master, who was a man of prudence, indulged me so far as to permit me to follow my own inclinations, the consequence of which was, that at the age of eleven, having out-rivalled what competitors I had of my own standing, in figures, writing, and French, I became desirous of learning Latin, to which, and soon afterwards to Greek, I diligently applied, insomuch that by the time I was sixteen, I could read and write them both fluently, and had a taste for the beauties of Virgil, Horace, Homer, or Hesiod. This attention, however, did not prevent me from perfecting myself in historical geography, from acquiring a tolerable knowledge of the Italian, and from studying for some time the High-Dutch or German language ; but this last not being to my taste, I applied but a short time to it.

At sixteen my father sent for me home, and took me under his own tuition, but not without having a young gentleman in the house, who was to assist him in this duty.

My father's first business was, to make me pass through a strict examination in my various branches of study, that he might be a perfect judge of what progress I had made : he was satisfied, and I was perfectly happy on the occasion.

My good friend and father then gave me a true idea of morality, taught me every part of my duty to God and my neighbour ; and, by seducing me to an admiration of the variegated works of the creation, he made me capable of adoring, with an heart replete with gratitude, the Great Maker of them ; and to contemplate with pleasure his power, his love of order, his bounty, his mercy, and all his divine attributes.

My studies now became amusements; I relished the truths that were daily disclosed to me, and almost every thing I saw conveyed to me a lesson of instruction.

My leisure hours were employed in skimming the surface of some branches of the mathematics; I read a little, and but a little, in geometry and trigonometry; navigation I thought was not likely to be of any use to me; and little did I then imagine that astronomy could contribute either to my pleasure or profit.

As my father held in his own hands a large tract of land, I had frequent opportunities of observing the various operations of husbandry; and whenever my father happened to be with me, he failed not to instruct me in the *rationalia* of every practice. “My son, says this worthy old man to me one day, be not surprised if on your entrance into life you find most farmers ignorant, obstinate, and, to the last degree, perverse. Once in three years they fallow, but wherefore they know not: their conceit is, that the land must be by two crops exhausted of its nourishing particles, and that it requires rest; whereas the truth is, that land, of what nature soever it may be, if it is properly managed, never requires any rest at all: the Great Giver of all things has enabled it to bear continual crops without being exhausted; nay, so little will it bear idleness, that, if we fail to crop it, the field will still bring forth an amazing quantity of those plants to which we give the name of weeds; and the only use of a fallow is, to destroy those weeds or plants, of spontaneous growth, which may infest our land; yet, when they are in any considerable number, it is always a sign of bad husbandry.”

This discourse was continued to a much greater length; but I give you the above, only to shew you the manner in which he conveyed to me instruction.

When I was twenty years of age, my father, who intended that farming should be the business and amusement of my life, thought proper that I should, in company with my tutor, visit the several counties of England, in order

order to observe the various methods of husbandry practised in different places, and to perfect myself in the geography and natural history of my native country. It cost me three summers to make this tour; for I travelled at my leisure, and spent the winter with my father at home. As I had by this time acquired some judgment in matters of husbandry, my father desired that I would make notes of such things as I saw in my journey, that were worthy of observation; and that I would twice a week write to him on the subject, adding in my letter such remarks as I might think necessary either to elucidate the matter, or to convey my sense of the utility or propriety of a practice.

This method gave me a habit of thinking with regularity, and of penning my thoughts in such a manner as to be easily understood. On these letters my father set so much value, that he carefully preserved them during his life, and at his death requested I would not destroy them. I have since several times read them over with some degree of satisfaction, and flatter myself they contain some things which might be of use were they published; but in their present form they are too diffuse; and God alone knows whether I shall ever have either health or leisure to digest them properly.

To proceed with my narrative: when I had finished my tour, my father thought proper I should read a little of the law, enough at least to enable me to preserve my property from invasion: with this view he took chambers for me in Clement's-Inn, then a place of note, though now sunk into obscurity; where I resided two years, attended the courts of law and equity, and made, I hope, no unprofitable use of my time; for the little knowledge I then acquired was often of great service to me in my future life.

Though five and twenty years of age, my father still thought there was something more required, which was to know wherein foreigners excelled us in their practical husbandry; for at that time we certainly were excelled, not only by the Dutch and Flemish farmers, but also by those

those of Normandy and Switzerland: these countries it was therefore determined I should visit, and I accordingly spent an entire year in making observations on their various methods of practice, and the instruments they used to assist them in their labour.

On my return to England, my father generously made over to me a part of his freehold estate for my support, and gave me besides wherewithal to stock a large farm which he took for me. Then it was I first began sensibly to perceive the advantages resulting from a good education: every thing seemed to prosper in my hands; and my farm was soon so much improved, that the former tenant, who broke on it on account, as he said, of the heaviness of the rent, was struck with astonishment when he saw the crops it bore, thinking it impossible that any man could pay so much rent, and yet be able to live.

It will now be necessary to make some remarks on the deficiencies of my education.

In the first place, gentlemen, I found myself greatly at a loss on account of my not having been taught drawing; for in my travels, as well abroad as in England, I frequently met with instruments of husbandry which were unknown to me, and which, by an accurate drawing, I could at any time have had made; but, as I could not draw, I was always, on these occasions, obliged to stay on the spot till I could get a model executed.

I found myself also greatly at a loss for want of a competent knowledge in geometry and mechanics; so that, when I met with a plough which might differ in some respects from any I before knew, I was frequently puzzled which to prefer, for want of understanding perfectly well the principles on which each was constructed.

Some of your readers may, perhaps, scarcely give credit to it, but certain it is, that a ploughwright, to be master of his business, should be a good mechanic; and no man can be certain of giving the share a true direction unless he understands something of geometry.

On many occasions in the earlier part of my life I found it necessary for a farmer to understand mensuration
and

and surveying, as well as planning of land. It is become a very common practice for farmers to lett their wheat and soft corn to harvest and in at so much *per* acre: now there are often disputes, about the quantity of land in a field, with the undertakers, which are soon determined if the farmer understands measuring of land. He should also know how to measure timber, which he would frequently find of great use to him. For my part, I own I thought it worth while to learn these articles, together with drawing, after I was thirty years of age.

I do not, as I observed before, pretend, gentlemen, to say that every farmer's son should be educated in the manner I was, because I am sensible it would be by far too expensive; yet is there an education which they have not, but ought to have, and which might, without any great matter of expence, be acquired.

Let the farmer have his son taught to read well, to write a good hand; and let him in due time also be perfected in vulgar and decimal arithmetic. Let him moreover be taught mensuration, surveying, and gauging. Let him be instructed in the *rationalia* and practice of malting and brewing; and let him besides have a general idea given him of the nature and causes of the various fermentations. Let him be able to draw so well as to take the representation of a living object, or describe in due proportion the several parts of any machine or engine. I should also approve much of his knowing something of geometry, and should be glad to add to all this the rudiments of botany, and as much natural philosophy as might serve to give him some idea of the nature of vegetation. As to the learned or foreign languages, I do not conceive they would be of much use to him: the old writers on husbandry he may read in English, and when any thing worth attention is published on the subject abroad, it is soon translated.

In the course of this education, I would have the youth read with attention the best of our English writers who have treated of husbandry; and, without a compli-

ment, I am inclined to believe that he would acquire more real and useful knowledge by reading your Volumes than all the other books on the subject put together. I would also have him at the same time read translations of such foreign writers as may convey most instruction to him. Let him see Du Hamel's Elements of Agriculture, Turbilly's Method of managing Waste and Uncultivated Land, the Foreign Essays on Agriculture and Arts, with some other things which have been lately translated from the French and German. As reading and the acquisition of practical knowledge should go hand in hand, the benefit resulting from them both would be doubled, and the theory he acquired by reading would be confirmed by experimental practice.

Some of your readers may possibly imagine that such an education cannot be acquired by every farmer's son, on a supposition that the expence would be too considerable: but this, in fact, is not the case; for reading, writing, accounts, with some branches of the mathematics, either are, or should be, taught in every free-school; and it would cost less to educate a youth in this manner than to bring him up for an exciseman. As to drawing, if every farmer would permit his sons to learn it, it would soon be taught at a very cheap rate; and, with regard to botany, he might, when his judgment grew ripe, acquire, by reading, a competent knowledge of it without the help of a master.

Could a youth so educated have the narrow mind and contracted ideas which we now find possessed by almost every farmer? Would not his understanding be enlarged by reading? Would not his mind be open to conviction? and would he not, finally, be glad to improve any methods he found to be erroneous, though they might unfortunately have been religiously and scrupulously followed by his ancestors for five generations?

Will any one be absurd enough to say, that were farmers to be so educated, agriculture would still continue unimproved? Surely no: the human mind naturally grasps
after

after knowledge; the more we know, the more we wish to know; and there are many things would immediately be altered, were the advocates for them once convinced that such alteration would conduce to their advantage.

The present race of farmers are not indeed so much to blame as may at first thought be imagined; they act up to what they know; they are, for the most part, amazingly ignorant, uneducated, and have their minds entirely occupied by prejudice: thus situated, what scope is there left for the exercise of their judgement? Their natural talents are fettered by custom; and we all know the force of habit, whether good or bad.

It may seem perhaps odd to some of your readers, yet must I, in this place, assert, that fashion has a great influence on husbandry. It is the fashion in a particular quarter to plough in such or such a manner: no farmer in that neighbourhood will dare to deviate from this method, lest he should be pointed at in the church-porch for singularity: a kind of bashfulness prevents him from quitting a wrong practice, and adopting another he knows to be right.

The more ignorant and uninstructed a man is, the more subject is he to be governed by prejudices; and if the farmers would but be persuaded to give their sons as good an education as is required to make a youth an exciseman, we should find that the succeeding race of farmers, instead of being ignorant and obstinate, would be knowing and intelligent; our methods of husbandry would in due time be greatly improved; and consequently that source from which all our riches, power, consequence, and happiness as a nation, are derived, I mean agriculture, would be extended and enlarged; and, as population must of course be encreased, England's glory would be in proportion enhanced.

I am, GENTLEMEN, as usual,

Your humble servant,

Hundreds of Essex,

A FARMER.

Aug. 4, 1765.

NUMBER XX.

*Premiums offered by the Society for the Encouragement of
Arts, Manufactures, and Commerce,*

FOR PROMOTING POLITE ARTS*.

119. DRAWINGS at the ACADEMY in SAINT MARTIN'S LANE.

FOR the best Drawings of a Human Figure after the Life, done at the Academy in St. Martin's Lane, by youths under the age of twenty-four, to be produced on or before the first Tuesday in February, 1766, and determined in proportion to their merits; Thirty Guineas.

These drawings are to be made during the meetings of the Academy next winter, according to the rules laid down by the Society, which will be hung up at the Academy. To be made with chalks only.

120. DRAWINGS from the DUKE of RICHMOND'S GALLERY. For the best Drawings of any Statue, at the candidate's option, in the Duke of Richmond's Gallery, by youths under the age of twenty-one, to be produced on or before the first Tuesday in December, 1765, and determined in proportion to their merits; Twenty-five Guineas.

These drawings must be left with the person who takes care of the statues, until they are delivered to the Society, and must be made with chalks only.

121. DRAWINGS of a HUMAN FIGURE or FIGURES from MODELS, CASTS, or BASSO RELIEVOS. For the best Drawings of a Human Figure or Figures from Models, Casts, or Basso Relievos, the principal figure not less than twelve inches, by youths under the age of twenty; to be produced on or before the last Tuesday in November, 1765, and determined in proportion to their merits; Fifteen Guineas. To be made with chalks only.

122. DRAW-

* We could not by any means before find room for these premiums, and now insert them at the desire of several correspondents. E.

122. DRAWINGS of a HUMAN FIGURE, after a PRINT or DRAWING. For the best Drawings of a single Human Figure, after a Print or Drawing, by Youths under the age of sixteen, to be produced on or before the last Tuesday in November, 1765; Fifteen Guineas.

123. DITTO of HUMAN FIGURES in GROUPEs. For the best Drawings of three or more Human Figures after a Print or Drawing, by Youths under the age of sixteen; to be produced as above; Twenty Guineas.

The drawings to be made with chalk, pencil, or pen, and of a larger size than the original, which must be produced at the same time.

124. DRAWINGS of HUMAN FIGURES or HEADS, after DRAWINGS or PRINTS. For the Drawings of Human Figures or Heads, after Drawings or Prints, by Boys under the age of fourteen; to be produced and determined as above; Twenty Guineas.

To be made with chalk, pen, pencil, or Indian ink.

125. DRAWINGS of BEASTS, BIRDS, &c. by YOUTHS. For the best Drawings or Compositions of Beasts, Birds, Dead-Game, or Still-Life, after nature, by Youths under the age of twenty; to be produced on or before the second Tuesday in January, 1766, and determined in proportion to their merits; Ten Guineas.

To be made with crayons or water-colours.

126. DITTO by GIRLS. For the best Drawings or Compositions of Beasts, Birds, Dead-Game or Still-Life, after nature, by Girls under the age of twenty; to be produced and determined as above; Ten Guineas.

127. DRAWINGS of FRUIT, FLOWERS, &c. by YOUTHS. For the best Drawings or Compositions of Fruit, Flowers, or Plants, with or without reptiles or insects, after nature, by Youths under the age of twenty; to be produced on or before the second Tuesday in January, 1766, and determined in proportion to their merits; Ten Guineas. To be made with crayons or water-colours.

128. DITTO by GIRLS. For the best Drawings or Compositions of Fruit, Flowers, or Plants, with or without reptiles or insects, after nature, by Girls under the age of

twenty; to be produced on or before the second Tuesday in January, 1766, and determined as above; Ten Guineas.

To be made with crayons or water-colours.

129. DRAWINGS of ORNAMENTS by GIRLS under Eighteen. For the best Drawings or Compositions of Ornaments, consisting of birds, beasts, flowers or foliage, fit for embroiderers, calico-printers, paper-stainers, or any other art or manufacture, by Girls under the age of eighteen; to be produced on or before the second Tuesday in January, 1766, and to be determined in proportion to their merits; Ten Guineas.

To be coloured, or not coloured, at the option of the candidate.

130. DITTO for the Use of WEAVERS only. For the best Drawings or Compositions of Ornaments, consisting of birds, beasts, flowers or foliage, fit for Weavers, by Girls under the age of eighteen; to be produced on or before the second Tuesday in January, 1766, and determined as above; Ten Guineas.

N. B. These drawings to be coloured.

131. DRAWINGS of ORNAMENTS by YOUTHS under Twenty. For the best Drawings or Compositions of Ornaments, being original designs, fit for embroiderers, calico-printers, paper-stainers, or any other art or manufacture, by Youths under the age of twenty; to be produced on or before the second Tuesday in January, 1766, and determined as above; Twenty Guineas.

To be coloured, or not coloured, at the option of the candidate.

132. DITTO for the Use of WEAVERS. For the best Drawings or Compositions of Ornaments, being original designs, fit for Weavers, by Youths under the age of twenty; to be produced and determined as above; Twenty Guineas.

N. B. These drawings to be coloured.

133. For the best original PATTERN for WEAVERS, by persons of either sex, of any age under thirty; to be produced on or before the second Tuesday in January, 1766; Fifty Guineas.

134. For

134. For the next in merit; Thirty Guineas.

135. DRAWINGS of any kind by BOYS. For the best Drawings of any kind, (human figures and heads excepted) by Boys under the age of fourteen; to be produced on or before the second Tuesday in January, 1766, and determined in proportion to their merits; Fifteen Guineas.

To be made with chalk, pencil, pen, or Indian ink.

136. DITTO by GIRLS. For the best Drawings of any kind, by Girls under the age of fifteen; to be produced on or before the second Tuesday in January, 1766, and determined in proportion to their merits; Twenty Guineas.

To be made with chalk, pencil, pen, or Indian ink.

N. B. It is required that the candidates for the above premiums produce the originals from whence they made their drawings, which must be larger than the originals.

137. DRAWING of a HORSE. For the best Drawings of a Horse from the life, by Youths under the age of twenty; to be produced on or before the second Tuesday in January, 1766, and determined in proportion to their merits; Twenty Guineas.

To be made with chalk, pencil, pen, or Indian ink, and not less than twelve inches in height, if in a standing posture; or if in any other posture, of a proportionable size.

138. DRAWINGS of LANDSCAPES. For the best Drawings of Landscapes after nature, begun and finished on the spot, by Youths under the age of nineteen; to be produced on or before the second Tuesday in November, 1765, and determined in proportion to their merits; Thirty Guineas.

Each candidate must mention, on the front of his drawing, from whence he took his view; and the drawings must be made with chalk, pen, Indian ink, or bistre.

139, 140, 141. HONORARY PREMIUMS for DRAWINGS. In order to promote a love of the polite arts, and excite emulation among the nobility, a Gold Medal will be given for the best original Drawing of any kind,

kind, made with chalks, black-lead, pen, Indian ink, or bister; a Silver Medal for the second in merit; and a Silver Medal for the third in merit; by young Gentlemen under the age of twenty, sons of peers, or peeresses in their own right, of Great-Britain or Ireland; to be produced on or before the first Tuesday in March, 1766.

142, 143, 144. The same premiums will be given, on the like conditions, to young Ladies, daughters of peers, or peeresses in their own right, of Great-Britain or Ireland.

145, 146, 147. A Gold Medal will be given for the best original Drawing of any kind, made with chalks, black-lead, pen, Indian ink, or bister; a Silver Medal for the second in merit; and a Silver Medal for the third in merit; by young Gentlemen under the age of sixteen, sons of peers, or peeresses in their own right, of Great-Britain or Ireland; to be produced on or before the first Tuesday in March, 1766.

148, 149, 150. The same premiums will be given, on the like conditions, to young Ladies, daughters of peers, or peeresses in their own right, of Great-Britain or Ireland.

151. HISTORICAL DRAWING. For the best Historical Drawing, the subject to be taken from the Greek or Roman history, being an original composition of five or more human figures, the height of the principal figure not less than eight inches; by persons under the age of twenty-five; to be made with chalk, black-lead, pen, Indian ink, or bister, and produced on or before the first Tuesday in February, 1766; Twenty Guineas.

* 152. For the next in merit, Ten Guineas.

153. MEDALLION. For the best Model of the Face and Reverse of a Medallion, its diameter not less than three inches, by Youths under the age of twenty-six; to be produced on or before the first Tuesday in February, 1766; Ten Guineas.

The face to represent the city of London personified, with her attributes, and the reverse the figures of Tame and Isis, with their proper attributes.

154. MEDALS.

154. MEDALS. For the best Copper Medal, the size of an English crown, which shall be executed the best in point of workmanship and boldness of relief, after a design procured by the candidate, and to be produced, and approved of by the Society, on or before the third Tuesday in May. The medal and dies to be delivered on or before the first Tuesday in February, 1766; Thirty Guineas.

155. For the next in merit, Twenty Guineas.

The subject to be the Surrender of the Havannah. Two medals of the die to be the property of the Society.

156. BASSO RELIEVO in CLAY. For the best Basso Relievo; the subject to be the Death of Lucretia; by youths under the age of twenty-five, being their own composition; the height of the principal figure not less than fifteen inches; to be produced on or before the first Tuesday in February, 1766; Twenty Guineas.

157. DITTO PORTLAND STONE. For the best Basso Relievo in Portland or Purbeck Stone, by artists under the age of thirty, the composition to be their own; the subject to be the Death of Socrates; the height of the principal figure not less than eighteen inches; to be produced on or before the first Tuesday in February, 1766; Thirty Guineas.

The basso relievos to remain two months with the Society after the determination.

158. MODEL in CLAY. For the best Models in Clay of an intire figure or figures; or Basso Relievos, by Youths under the age of twenty, being their own composition; to be produced as above, and determined in proportion to their merits; Fifteen Guineas.

159. For the best Models in Clay, not less than twenty inches high, from the Bacchus of Michael Angelo in the Duke of Richmond's Gallery, by Youths under the age of twenty-two; to be produced as above, and determined in proportion to their merits; Fifteen Guineas.

160. MODELS of ORNAMENTS in WAX. For the best Models in Wax of Figures of Beasts or Birds, Fruit, Flowers or Foliage, (fit for goldsmiths or any workers

workers in metal) by Youths under the age of twenty-one, taken from nature, and not from prints, drawings, models, or any fine works; to be produced on or before the first Tuesday in February, 1766; Twenty Guineas.

161. DITTO in WAX by GIRLS. For the best Models of Ornaments in Wax, consisting of Birds, Beasts, Fruit, Flowers or Foliage, fit for any trade or manufacture, by Girls under the age of twenty-one; Twenty Guineas.

To be produced on or before the first Tuesday in February, 1766.

162. ETCHINGS by YOUTHS. For the best Etchings copied from any prints, not less than nine inches by six, each composition to be larger than the original, representing landscapes with figures, by Youths under the age of twenty-one.

To be produced, with the plates, on or before the second Tuesday in November, 1765, and determined in proportion to their merits; Twenty Guineas: and three impressions to be taken from each of them for the use of the Society.

163. DITTO by GIRLS. For the best Etchings copied from any prints, not less than nine inches by six, each composition to be larger than the original, representing landscapes with figures, by Girls under the age of twenty-one.

To be produced, with the plates, on or before the second Tuesday in November, 1765, and determined in proportion to their merits; Twenty Guineas: and three impressions to be taken from each of them for the use of the Society.

164. For the best Etching of a History Piece, consisting of not less than three human figures, the principal one not under eight inches in height, each composition to be of a different size from the picture or drawing from which it is taken, by persons under the age of twenty-eight; Twenty-five Guineas.

165. For the next in merit; Fifteen Guineas.

To be produced, with the plates, and also the pictures or drawings, on or before the first Tuesday in January, 1766; and two impressions to be taken from each of them for the use of the Society.

166. METZOTINTOS by YOUNG MEN. For the best Scraping in Metzotinto of a Portrait from any picture of which there is no print, by persons under the age of twenty-five; Twenty-five Guineas.

The pictures to be produced, with the plates, on or before the second Tuesday in November, 1765, and determined in proportion to their merits; and three impressions to be taken from each of them for the use of the Society.

167. DITTO by YOUNG WOMEN. For the best Scraping in Metzotinto of a Portrait from any picture of which there is no print, by young Women under the age of twenty-five; Twenty-five Guineas.

The pictures to be produced, with the plates, on or before the second Tuesday in November, 1765, and determined in proportion to their merits; and three impressions to be taken from each of them for the use of the Society.

168. ENGRAVING LANDSCAPES. For the best Engraving of a Landscape with figures, after a picture or drawing made by the candidate from a picture of which there is no print, not less than sixteen inches by twelve, by persons under the age of twenty-four; Twenty-five Guineas.

169. For the next in merit; Fifteen Guineas.

To be produced, with the plates, on or before the second Tuesday in November, 1765, and of a different size from the original; and three impressions to be taken from each of them for the use of the Society.

170. ENGRAVINGS of HISTORY PIECES. For the best Engraving of a History Piece, consisting of not less than three human figures, (whole or half lengths) the principal one not under seven inches in height; to be produced, with three impressions for the use of the

Society, on or before the last Tuesday in January, 1766; Forty Guineas.

171. For the next in merit, Twenty-five Guineas.

172. ENGRAVINGS of a HUMAN FIGURE or FIGURES. For the best Engravings performed by persons under the age of thirty, after a picture in which there is at least one human figure, which figure in the engraving shall not be less than eight inches high; to be produced on or before the last Tuesday in January, 1766; Twenty Guineas.

173. For the second in merit, Twelve Guineas.

274. For the third in merit, Eight Guineas.

N. B. The claimants for all the above-mentioned premiums must produce the drawings, with the plates, at the time they make their claims, and three impressions taken from each of them for the use of the Society.

The claimants may have begun their engravings since the first of January, 1764.

175. CAMEO. For the best Cameo engraved on an onyx, representing the head of Ganymede, (a cast of which is in the Duke of Richmond's gallery) to be delivered, sealed up, on or before the second Tuesday in November, 1765; Ten Guineas.

176. For the next in merit, Five Guineas.

177. For the best Cameo engraved on an onyx, representing the Dying Gladiator, (a cast of which is in the Duke of Richmond's gallery) to be delivered, sealed up, on or before the second Tuesday in November, 1765; Twenty Guineas.

178. For the next in merit, Ten Guineas.

179. INTAGLIOS. For the best Intaglio engraved on a cornelian, representing the head of the Apollo Belvedere in the gallery of the Duke of Richmond, to be delivered, sealed up, on or before the second Tuesday in November, 1765; Ten Guineas.

180. For the next in merit, Five Guineas.

181. For the best Intaglio engraved on an oval red cornelian, representing the Apollo Belvedere in the Duke
of

of Richmond's gallery, by persons under the age of twenty-eight; to be delivered, sealed up, on or before the second Tuesday in November, 1765; Twenty Guineas.

182. For the next in merit, Ten Guineas.

The gems to be left with the Society one month, and three impressions in sulphur to be taken from the Intaglios for the use of the Society.

183. BRONZES. For casting in Bronze the best Figure or Groupe, and repairing the same in the best manner; if a single figure, not less than ten inches high, and if a group, not less than twelve inches; to be brought in repaired, on or before the first Tuesday in February, 1766; Forty Guineas.

184. For the next in merit, Twenty Guineas.

It is not expected that the casting and repairing be the work of a single person. The casts to be shewn to the Society before they are begun to be repaired.

The bronze which gains the premium to be left with the Society one month.

185. HISTORICAL PICTURES in CHIARO OSCURO. For the best original Historical Picture in Chiaro Oscuro, the subject to be taken from the Greek or Roman history, containing five or more human figures, the height of the principal figure not less than two feet six inches, nor more than three feet; Fifty Guineas.

186. For the next in merit, Twenty-five Guineas.

To be produced on or before the second Tuesday in March, 1766.

187. PAINTING in ENAMEL. For the best original Historical Painting in Enamel, on a plate not less than three inches by two and a half, containing not fewer than three human figures; Fifty Guineas.

188. For the next in merit, Twenty-five Guineas.

Proofs must be made, to the satisfaction of the Society, that the whole of the picture was painted in England, and since the first of January, 1765.

N.B. It is required that the picture be painted and fired by the claimant only.

100 MUSEUM RUSTICUM

The pictures to be delivered in on or before the first Tuesday in January, 1766.

189. PAINTINGS of SEA PIECES. For the best original Sea Piece on a canvas, five feet six inches in length, and three feet and a half in height; Fifty Guineas.

190. For the next in merit, Twenty-five Guineas.

191. For the next in merit, Ten Guineas.

To be produced on or before the second Tuesday in March, 1766; and those which gain the premiums to remain with the Society two months after the decision.

192. STATUES in MARBLE. For the best original Statue of a Naked Figure, as large as the Life, wrought in White Marble; to be produced on or before the last Tuesday in March, 1766; One Hundred and Forty Guineas.

193. For the next in merit; Eighty Guineas.

194, 195. The like premiums will be given for the best original Statues, to be produced on or before the last Tuesday in March, 1767.

196. BASSO RELIEVOS in MARBLE. For the best Basso Relievo wrought in White Marble, being an original composition of five or more human figures; the height of the principal figure not less than twelve inches; to be produced on or before the last Tuesday in March, 1766; Fifty Guineas.

197. For the next in merit, Twenty-five Guineas.

198, 199. The like premiums will be given for Basso Relievos in Marble, on the above conditions; to be produced on or before the last Tuesday in March, 1767.

Proof must be made, to the satisfaction of the Society, that the whole of each statue and basso relievo was executed in England; those which are sent in claim of the premiums in 1766, since the first of January, 1764; and those which are sent in claim of the premiums in 1767, since the first of January, 1765; and those statues and basso relievos which gain the premiums shall remain with the Society two months after the decision.

200. SURVEY of COUNTIES. The Society proposes to give a sum not exceeding One Hundred Pounds, as a gratuity to any person or persons who shall make an accurate survey of any county, upon the scale of one inch to a mile; the sea-coasts, and the bearings of the head-lands from each other, in all maritime counties, to be correctly laid down, together with the latitudes and longitudes: and they desire to be understood, that they do not intend by this advertisement to bind themselves to any particular time for paying of the said gratuity, that they may be better able to procure satisfactory proofs of the merit of such performance; and if any person or persons do propose to make such survey, they are desired to signify their particular intentions on or before the second Tuesday in November next, that the Society may not engage in greater expences than shall be found convenient.

201. As a further encouragement, the Surveyor that will give an exact and accurate level and section of the rivers, (in any county surveyed) that are capable of being made navigable, shall be entitled to an additional gratuity.

N. B. A candidate being detected in any disingenuous methods to impose on the Society, will forfeit the premium for which he is a competitor, and be deemed incapable of obtaining any premium for the future.

No person who has gained the first premium in any class will be admitted a candidate in a class of an inferior age; and no candidate shall receive more than one premium in one year; nor will they who for two successive years shall gain the first premium in any one class, be ever again admitted as candidates in that class.

Persons to whom premiums shall be adjudged, will be expected to give satisfactory proofs, that the performances by them produced are entirely their own without assistance.

The candidates for etchings and drawings shall give proof of their abilities before the committee, or such person or persons as they shall appoint, except the candidates at the Academy in St. Martin's Lane.

NUMBER XXI.

Premiums offered by the Society,—FOR FISHERIES.

310. STOCK FISH*. **T**O every person who shall, on or before the last day of December, 1765, import into the port of London any quantity (not less than one hundred pounds weight) of good and merchantable Stock Fish, caught by British subjects in any part of his Majesty's dominions in Europe or America, and shall produce a sample thereof to the Society, (not less than six fish) the sum of Fifteen Guineas; but in case there should be more than six candidates offer for this premium, then the sum of One Hundred Guineas only will be equally divided among all such candidates.

N.B. Certificates under the hand and seal of some known magistrate or chief officer of the county, parish, precinct, township, or other division of the colony, island, or county where such fish were cured, that the fish were cured in his Majesty's dominions, must be produced to the Society, with the above samples, on or before the said last day of December, 1765.

The Method of Cure.

“ The fish being caught in winter must be gutted, the
“ head taken off, the blood carefully squeezed out and
“ cleansed from the back bone, then washed in salt water,
“ and hung up in sheds to be kept free from being wet,
“ and there to be frozen till they be perfectly dry.”

N.B. No premium will in any case be given, unless the performance be deemed by the Society to have sufficient merit

* Numbers 308. and 309. contain the premiums for encouraging the turbot fishery, which we now omit, having already been inserted in our work. See Number LV. page 237. Vol. IV.

merit to deserve encouragement; and the Society reserve to themselves the power of giving in all cases such part only of any premium as the performance shall be judged to deserve.

It is required, in all cases where it can be done, that the matters for which premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each claimant thinks fit, he or she sending with it a paper sealed up, having on the outside a corresponding mark, and on the inside the claimant's name and address.

No papers shall be opened but such as gain premiums: all the rest shall be returned unopened, with the matters to which they belong, if enquired after by their marks within two years; after which time, if not demanded, they shall be publicly burnt, unopened, at some meeting of the Society.

Whereas there are Societies for the encouragement of arts, manufactures, and commerce, in that part of Great-Britain called Scotland, and also in Ireland; therefore all the premiums of this Society are designed for that part of Great-Britain called England, the dominion of Wales, and town of Berwick-upon-Tweed, unless expressly mentioned to the contrary; and the claim shall be determined as soon as possible after the delivery of the specimens. Proper affidavits of such certificates as the Society shall require, are to be produced on every article.

All matters, for which the Society proposes premiums, must be begun after the publication of such premiums, unless there be a particular exception in the said publication.

No person will be admitted a candidate for any premium offered by the Society, who has obtained a patent for the exclusive right of making or performing any thing for which such premium is offered.

NUMBER XXII.

An improved Way of procuring good and clean Wheat-Crops.

GENTLEMEN,

AS you seem to encourage all well-meaning men, who wish to improve our national husbandry, permit me for once to solicit a place in your work for a letter, though it may not, perhaps, be so valuable as some others, written by your more enlightened correspondents.

I am, it is true, but a young man; yet have I made some remarks in farming, which, in my humble opinion, may prove not unuseful to many of your readers.

It is now upwards of seven years that I have been tenant of a considerable farm in Essex; but as there are some particular circumstances attending this farm, I must beg leave to say a few words on the subject.

The soil, which is, for the most part, a fine mellow loam, or what is in general called a good wheat soil, was in very good heart, and not impoverished; yet the last tenant broke on this farm, and the landlord lost by him near two years rent; for his crops of wheat were continually damaged by smut, let him take what care he would of the seed, and were besides often laid, and the land got very foul, though he was not sparing of his fallows.

On the contrary, since I have occupied this land, it has borne large crops of good sound wheat, with very little smutty corn, and barley, oats, peas, beans, and other things in proportion. What will appear still more surprising is, that I do not lay on half so much dung as he did.

It will now, perhaps, be necessary to explain this seeming paradox. At no great distance from the farm lives the landlord, who is a man of fortune, and drives a set of horses. This gentleman keeps no land in his own hands,

hands, so that he was for many years obliged to buy all the straw used for the litter of his stables, which amounted to a very considerable quantity: however, when the last tenant of this farm came into it, having been a servant in the family, he offered to supply the 'squire with straw for his stables, provided he might have all the dung, except what the gardener had occasion for. The 'squire thought this a good proposal, and the farmer imagined he had the best of the bargain; so the matter was soon settled.

Now, gentlemen, you are to understand, that the 'squire kept, besides seven coach-horses, a stable of hunters, a number of road-horses, and a pack of hounds; so that there was made on his premises, in a year, an incredible quantity of rich dung.

The farmer imagined he was now in a fair way of making his fortune; for his father had taught him, that the man who can command dung is always sure of large crops: but this did not prove true in the present case.

To proceed; my predecessor went on ploughing his land, got his fallows in good order, dressed them largely with dung, and always sowed them with wheat.

His crops of this noble grain, however, by no means answered his expectations: his wheat constantly looked well and promising in the winter and the early part of the spring of the year; but as it advanced, it grew rank, and at harvest was either run all to straw, and was besides very smutty, or else, if a heavy shower of rain happened to fall, it was lodged, matted, and grew. This was indeed a very mortifying circumstance, but our farmer could find no remedy for it. He several times, without success, tried folding some sheep on his wheat; but this part of husbandry, for want of skill, he managed so badly, that he lost two entire crops, for he had scarcely the return of his seed at harvest. This could never hold long; so that in the end he was, as I said before, broke and ruined.

This man never could be persuaded that any part of his loss was to be attributed to the dung he laid on his land,

though he constantly manured it with the horse-dung before it was half rotten, and without any mixture to allay its great heat: this kept the soil in a constant state of fermentation, and stocked it with weeds, insomuch that, when I took possession of the farm, some of the soil was absolutely mouldy, and stunk again, it was so rank.

I will now, gentlemen, inform you of my method of management, that you may be enabled to judge how far I was benefited by the errors of my predecessor.

I found sixty acres of fallow ready for sowing with wheat: these, as the land was rank, I sowed with the winter tare, which I knew, by experience, would choak the weeds, and abate the rankness of the soil. In some parts, where the soil was not so rank, I ploughed in the tares in order to sow wheat over them; in other parts I suffered the tares to stand for a crop, which, however, was not considerable, they ran so much to straw or haulm.

When the tares were off, I got the land instantly in order, and sowed the whole with wheat, of which I had a better and cleaner crop than had been known upon the land for upwards of seven years before: this all my neighbours acknowledged: however, it was neither clean enough, nor considerable enough, to satisfy me. Some of your readers may, perhaps, wonder what I did with my tares, as but few are sold at the country markets; but I must inform them, that I live within ten miles of a seaport town, whither I sent them at various times, in order to their being carried by sea to London.

I am to observe to you, gentlemen, that I continued the agreement of giving the squire straw for his dung; but I made a use of it very different from my predecessor.

I make it a rule never to manure for wheat, or sow wheat on a fallow. I do not indeed allow many fallows on my land; and when I do, I generally sow my fallow with barley, to which I allow four or five ploughings. This commonly yields me a large return, and I have a good crop of wheat after it.

This, however, is not my general method; for I am very fond of the hoeing husbandry, to practise which, in some degree, is the only infallible way of keeping land clean. To begin then with my method, I never lay dung alone on my land, let it be ever so rotten; but as soon as I get any long dung from the 'squire's, I carry it to my compost-heap, where it is mixed in alternate layers or beds, with fresh virgin earth, (if I can get it) lime, or chalk, lime rubbish, scourings of ditches and ponds, turf, leaves of trees, and all the dung and offal of my family, of the hog-yard, the poultry-yard, and the dog-kennel. As to my pigeons-dung, I always preserve it to mix with foot, and use the mixture as a top-dressing for my wheat, whenever it happens to be too backward in the spring.

But to return to my compost: I have always several distinct heaps of different ages, and I sometimes leave it three years before I use it, and never lay on any under two years old.

When I have got a plot of ground in order, I give it a thorough good dressing of this compost, which I immediately plough in. I then sow it with some crop that requires hoeing, such as horse-beans, broad-beans, or white or grey peas. During the whole summer, I take care to keep these crops very clean by hoeing, especially if the season is rainy; and I am particularly cautious in preventing any of the weeds from perfecting their seeds.

When my hoeing-crop, which generally more than pays me all my expences, is off the land, I immediately get it into as fine tilth as I possibly can, by repeated ploughings, and then sow it with either wheat or barley, whichever is likely to pay me best; for little as some of your readers may think of it, barley, when it is sown on good land well prepared, is very frequently as profitable a crop as wheat.

By thus sowing my wheat after a hoeing-crop with dung, I have always a good return of clean corn, often

five quarters on an acre; and my land will still be in heart enough to give me a reasonable crop of oats; after which, without any fallow, comes my hoeing-crop, &c.

When I sow barley after the hoeing-crop, I suffer wheat to follow it; and then it is that, if I find it necessary, I give the wheat in the spring a top-dressing of soot mixed with pigeons-dung.

I sometimes allow only six pecks of wheat-feed to an acre: this is when I sow over it, in the spring of the year, eighteen pounds of broad clover-feed, which I harrow in with a pair of very light harrows; and it does not in the least damage my wheat-plants. I leave the clover only two years on the land; for the second year, after I have mown the first crop for hay, I suffer the second to grow very rank, (having given my land a slight dressing from my compost dung-hill the preceding year) which I plough in, and over it sow wheat, to be harrowed in on once ploughing.

These crops of wheat are smaller in quantity than any others I get, but the grain is finer, plumper, brighter, and heavier, generally selling for more at market, as being always very clean and clear from seeds of weeds.

In my method of farming, some particulars are to be noted. In the first place, as my crops succeed one the other very quick, I am under a necessity of having all my stubble extirpated before I give the land the first ploughing after the crop is off. If it is a wheat or bean-stubble, I generally have it all pulled up by hand by women and children; barley and oat stubbles I have torn up by a pair of loaded drags, and afterwards gathered into heaps and carted to the compost-heap. This I do to prevent the stubble from being buried by the plough, and from growing mouldy in the land; from which mouldiness I have great reason to think smut often proceeds.

Another thing to be noted is, that I allow less seed to my land than most of my neighbours, my quantity being from seven to nine pecks of wheat, from nine to twelve of barley, and about twelve of oats to an acre of land;
but

but it is always to be presumed that the seed I sow is good. If any farmer should imagine that these quantities are too small, let him suppose every wheat-plant to occupy a space of six inches square, which is small enough: let him then calculate how many such spaces there are in a square acre. When he has done this, let him proceed to count how many grains of wheat there are in a pint, which multiply by the number of pints in nine pecks, and he will find by the result that I, in fact, allow too much seed.

I intend this letter, gentlemen, only as a sketch of my method of farming; and, in truth, it was chiefly written with a view of satisfying some of my neighbours, who are readers of your work. These farmers saw that my crops were better than those of my predecessor, yet wondered why they should be so, for they know not the method of managing their dung to the best advantage; nor are they at all acquainted with the value of hoeing-crops, though they see so many farmers in the county fond of sowing them. Another thing puzzled them, which was, how a man could possibly carry on the business of a farm without fallowing all his land once in three years.

If you give this letter a place in your very valuable work, I may possibly, at some future time, communicate to you some other piece from a different motive*.

I am, GENTLEMEN,

Your constant reader,

Essex,
August 2, 1765.

A YOUNG FARMER.

* We shall be glad to hear from this farmer as often as he chooses to write. E. O.

NUMBER XXIII.

A Proposal for the Increase of Apiaries in Ireland, addressed to the Dublin Society, by Sir James Caldwell, Bart. Fellow of the Royal Society.

THE offer of pecuniary rewards to those who excel in any useful art or manufactory, has a much more powerful and extensive influence than appears at the first view: the benefit is much greater to him that obtains such a reward, than the mere acquisition of the sum to which it amounts; for it confers an honourable distinction upon him, to whom an encrease of reputation is an encrease of wealth. A reward of an hundred pounds offered to an artificer who shall excel in his profession, excites an emulation in proportion to the ultimate advantages it will produce to the winner, which is probably, not only in the estimation of fancy, but of reason, more than twenty times the sum. The benefit that it produces to the public is also in proportion to the benefit it confers on the individual; for the more powerfully it excites emulation, the more effectually it must produce improvement: it is at once both the cause and the reward of merit, in proportion, not to its intrinsic value, but its relative importance to the competitors: and in this view, the money appropriated to encourage ingenuity and diligence, is more improved than by any other application; for its value to the individual is encreased, perhaps, as an hundred to one, by the manner and circumstances in which he acquires it; and with respect to the nation, the encouragement of arts and manufactures is an advantage infinitely greater than could arise, not only from employing the inconsiderable sums which are given in premiums another way, but from the whole produce of the mines of Mexico and Peru, if they could be transported into this kingdom, and wrought by the very hands that now ply the loom, or cultivate the ground.

Nor

Nor is the advantage of these rewards confined to the artificer, by whom they happen to be obtained: setting aside the national advantage arising from the general improvement which the competition necessarily produces, the competitor acquires some degree of eminence and honour, merely by entering the lists: if the scale hangs doubtful between several, the gain of all is nearly equal; for the mere pecuniary reward is but a very inconsiderable part of the whole; and even those whose performances do not hold the judges in suspense, will be drawn out of a state of obscurity, in which such abilities, as they possess, might have been buried for ever; they will at least be known; they will have their partisans; they will be stimulated to new efforts to justify the partial opinions of their friends, who will naturally encourage them, in hopes that they will succeed.

The advantages that have already accrued from the Dublin Society, an institution established upon these principles, and with these views, are so manifest and important, and the ability and integrity of the members are so well known, that the last session of parliament gave them the disposal of ten thousand pounds of the public money, and the present session has given eight thousand more.

As a new subject of public attention, and of this Society, with respect to the rewards which they may hereafter offer, the encouragement of apiaries in this kingdom, is now proposed to their consideration.

BEEES have been often the theme of the poet, the legislator, and the philosopher; they have been considered as emblems both of public and private virtue, of subordination, diligence, and ingenuity; they have been exhibited in many characters, and have been the subject of many volumes; and the bee may very justly be now recommended to the Dublin Society as a manufacturer, the maker of honey and of wax.

The excellence of a manufacture depends upon its being fabricated of cheap materials, so as to be valuable chiefly by the labour and skill of the artist, upon the facility

facility with which it may be established; and the usefulness of the commodity to the public.

In all these particulars, the manufacture both of honey and of wax, must be allowed to excel. These articles are extracted by an instinct, wonderful indeed in its nature, but exercised with spontaneous facility, from a great variety of odoriferous plants, which, after this extract has been made, are as useful and as beautiful as before: the honey and wax are clear gain, like the corn picked up by poultry at a barn-door: as this would be trodden under foot, and wasted, if not brought to our table, transmuted into the chicken that preserves it; so would the honey and wax, with all their salutary, pleasing, and useful qualities, perish in the flowers that produce them, if not extracted and fabricated by the bee. The little dwellings in which these manufacturers carry on their work, are constructed at the smallest expence, and the construction of them furnishes employment for the lame and the decrepit, those whom age and infirmity would otherwise leave to suffer, rather than to enjoy existence in total inactivity, weary of themselves, and a burden to others. The importance of these articles of trade deserves a more particular consideration.

That there is a consumption of wax in this kingdom, (Ireland) greater than its produce, is undeniable, because considerable quantities of it are imported; and that it is more for our advantage to produce than to import it, will scarcely be denied: the encouragement of apiaries therefore, with a view to the wax only, must be allowed to be a measure directly tending to the public benefit. It may, perhaps, be said, that the principal consumption of wax being in candles, one of the last refinements of a luxurious age, it would be more eligible to prevent than to provide for its gratification; but without shewing the folly of indiscriminately declaiming against luxury, or shewing, what would be easy to shew, that without the gratification, and even multiplication, of artificial wants, no nation, in the present constitution of things, could long support
itself

itself in a state of plenty and independance, it will be sufficient to observe, that no reason can be given why wax-candles should not be substituted for tallow, by those who can afford it, which will not equally prove that tallow-candles should not have been substituted for the lamps of rancid and foetid oil used by our ancestors.

In a commercial view, the great consumption of wax in candles, if we could produce a sufficient quantity at home, would be a national benefit; because it greatly encreases our exports of tallow, from which a very considerable profit accrues*.

It may also be observed here, that there is great probability of the government's encreasing the consumption of wax in candles still farther, by directing wax-candles to be burnt on board the navy. A proposal for this purpose has already been laid before the admiralty in England, in support of which it is alledged, that the burning tallow between decks, where candles of some sort must always be used, greatly encreases the noxious and putrescent vapours which those close places render so fatal to lives which it is of the utmost importance to preserve; that the great heat of those places causes the tallow to melt, so as to occasion great waste; that tallow-candles become so soft as frequently to bend, and at length fall down, by which fires have often happened, and are perpetually liable to happen; and, in one word, that they are the cause of great filth, danger, and sickness. These reasons, which will probably weigh with the state, did actually determine one of our admirals, several years ago, to burn wax on board his own ship, at his own expence, which he declared was attended with such advantages, that he would have continued it if the charge had been ten times as much as he found it; for, he said, the difference between wax and tallow for the year did not amount to more than ten pounds †.

VOL. V. No. 24.

Q

Under

* It must be remembered this is spoken of Ireland. E.

† This was told to a friend of Sir James Caldwell, by Admiral Knowles, of himself, in the manner above related.

Under these circumstances, the encouragement of apiaries becomes the more a national concern; for if we cannot only supply our encreased home consumption of wax, but export it, we shall turn the balance of commerce, in a very considerable article in our favour, which is now against us, and must be more so, if, upon the encreased consumption of wax, we must encrease our imports in that article.

Besides the use of wax in candles, which is of all modern luxuries the most salutary and agreeable, it is an article absolutely necessary in many manufactures and trades, and in the public offices; it is also of great medicinal virtue.

As to honey, it is certainly a necessary of life, the want of which can be supplied only by sugar: in proportion as honey, a home produce, can be made cheap, sugar, a foreign commodity, will be less bought, and consequently less will be imported. Of honey we make mead, a most pleasing and salutary liquor: of honey is also made a kind of mum, called old ale*, which in some families in Ireland is in great estimation. If honey is made cheap, it will greatly lessen the consumption of made wines, the principal ingredient of which is sugar; and the good effect will be, not only the substitution of a home for a foreign commodity, but of a wholesome for a pernicious liquor. But honey is still of more importance for medicinal than alimentary purposes: no physical writer, from Hippocrates to Huxham, has mentioned it without the highest encomium: it is penetrating and deterging, and is therefore good in obstructions of all kinds, especially those arising from viscid humours. It is also a sovereign remedy in the torfumes, a disease peculiar to this country, arising from its great moisture, which produces infarctions of the breast, with difficult perspiration, and other morbid symptoms. The inhabitants of Ireland in general have cold constitutions, the natural effect of their food and manner of life. This
constitution

* We should be glad if some of our correspondents in Ireland would inform us of the method of making this *old ale*. E. R.

constitution renders them liable to phlegmatic disorders, for which honey is a most excellent remedy, and from which it is a certain preservative. Honey therefore should be brought within the reach of the poor; for the life and health of the poor are of infinitely more importance to the state than the life and health of the rich.

The bee therefore seems to have a claim to the attention of the public in general, and in particular to the liberality of this society, with respect to both the commodities which he fabricates, honey and wax. This country is extremely well adapted, by circumstances and situation, both to his nature and trade, the climate being temperate, the spring early, the verdure perpetual, and the herbage abundant. This may appear, from honey and wax being mentioned, as articles of commerce and exportation, in all the old books of geography. The following proposal is therefore offered to the consideration of the society.

I. That one hundred pounds shall be allotted for the encouragement of apiaries, to be distributed on the third of October, 1765, in the proportions, upon the conditions, and under the regulations following:

	<i>l.</i>	<i>s.</i>	<i>d.</i>
To the person having the greatest weight of honey and wax, above six hundred weight, including the hive and the bees	—	—	30 0 0
To the person having the next greatest weight, above five hundred weight	—	—	25 0 0
To the person having the next greatest quantity, above four hundred weight	—	—	20 0 0
To the person having the next greatest quantity, above three hundred weight	—	—	15 0 0
To the person having the next greatest quantity, above two hundred weight	—	—	10 0 0

II. That the hives shall be weighed in the gross, the bees being alive, which is known by experience not in the least to prejudice them, by a proper person, in the presence of the minister or curate of the parish, or any

justice of peace in the neighbourhood, or any other person of a reputable character, known to a member of the Society, and a person appointed by the proprietor of the bees*.

III. That a certificate of such weight, and the number of hives, shall be signed by such minister, or curate, or justice of peace, or reputable person.

IV. That the person weighing the hives, shall make an affidavit of their number and gross weight, that they are of the usual size and thickness; and that, to the best of his knowledge, no fraud has been practised to encrease their weight†.

V. That the proprietor of the bees shall also make an affidavit, that the number of old hives so weighed, attested, and certified, have been all his property six months before; and that all the new hives so weighed, attested, and certified, are swarms from the old hives; and that, to the best of his knowledge, none of those hives were above six Irish miles from his dwelling-house when weighed and certified, or for six months before.

VI. That such certificate and affidavits shall be produced by the claimants of the premiums, as the condition upon which alone they can receive it.

To this proposal the author can think of no objection, except the premiums that have already been given for honey. But as these premiums have been very small, and very much confined in the application, few persons in the kingdom, on that account, have encreased their stock of bees; it is therefore hoped, that this present proposal does not stand precluded; the general utility of a premium for these
articles

* The weighing of bees is by no means difficult; it is to be done, after sun-set, in the following manner: a linen cloth is slipped between the hive and the stool, and knotted at the top of the hive, which is then lifted up by the knot and put into the scale; after weighing, the hive is again put on the stool, and the cloth slipped from under it.

† Straw, rush, or bent hives, have been found, by long experience, to answer best; and no person shall be entitled to the premium that makes use of any other kind.

articles being acknowledged, even by the very measure that has proved ineffectual for the purpose. The previous offer of premiums on these articles, therefore, rather supports than subverts the measure now proposed.

By this measure it is hoped bees will be greatly increased in a short time; for as the proprietors could not keep such numbers of bees without employing the poor, to the extent of six miles round them, to take care of them, which they would gladly do for a small gratuity, it is reasonable to suppose, that perceiving the advantages derived to the owners from the bees they look after, they would be induced to set up hives, and keep bees for themselves. From this single object, however inconsiderable, a habit of attention might be acquired by those who are now totally idle: hope of advantage might be awaked in the breasts of those whose industry is now depressed by despondency, and the advantages would be still more important and extensive than any that have been yet suggested, which are surely more than sufficient to justify an experiment, which may be made at so small an expence as one hundred pounds.

It is to be observed, that this country, in many parts, abounds with heath and furze, which blossom in September, and is excellent pasturage for bees.

N U M B E R XXIV.

*Observations on the Growth and Destruction of Seagrim,
or Rag-Wort.*

GENTLEMEN,

A Most pernicious weed, called in this country *seagrim*, or *rag-wort*, having only of late years made its appearance, at least in any considerable quantity, in this estate, (though too well known in the neighbourhood long before) I send you such observations as have occurred to me concerning its *growth* and *destruction*, heartily wishing,

ing, that an effectual method of destroying it may be known and practised.

As it is probably known in other places by names different from what it bears in this, I will give such a description of it as may, I hope, prove sufficient to the practical reader, though not in the *technical* words of botanists.

This plant has a stalk, in its early state, green, but, as it advances in age, inclining to *violet* or *purple*, especially downwards. Its flowers are yellow, and thick-set, and composed each of a number of small-pointed leaves. It runs to seed in the latter end of summer. The smell, both of the stalk and leaves, which are jagged, (whence probably it obtains one name) and the flower itself, are offensive to all animals, I think; for I have observed that hardly any creatures feed upon it, except almost hungered or starved. I have not indeed observed whether or no asses reject it.

Like most other weeds, it thrives best in the best soils, either *natural* or *artificial*; and I took up a plant of it in my orchard, about two years ago, (with the root) which, when in flower, touched my chin, (my height is about five feet eight or nine inches) and its root, which is round, and thick set with taws, was much larger than a new-born child's head: but the usual dimensions are much less than these.

About four years ago, I observed the spreading of this weed in that part of this estate which was in our own hands. I took notice, that neither cows nor horses eat it; and when I smelled it, I ceased to wonder that they did not. It was obvious to remark, that a weed so bulky as this, and so gross, must extract much nourishment from the earth, and that it was advisable to get rid of it as fast as possible. The most easy method was mowing. I therefore ordered a servant to mow these weeds in the pastures as near to the ground as he could; and I hoped that the common mowing in the meadows would be sufficient to destroy them: but I soon found my mistake; for

for in a very few weeks these offensive strangers shot up again into stalk and leaf, and even flower, though all in much smaller size than before, but with this disagreeable circumstance, that the root was so far from being injured with the scythe, that for one stalk several arose, and the root seemed to have gained new vigour from the * wound.

I now applied myself to plucking up by the roots these odious inmates, and found new difficulties; for while the ground was dry, as it usually is in the latter end of summer, I found the stalks of such of the *seagrims* as were longest, and afforded the tightest grasp, either break in plucking, and leave the root in the ground entirely, or at best bring with it only a small part of the root; and when the wet weather came on, and loosened the ground, and made it *possible*, or even *easy*, to bring away the whole ball of the root, yet the season of seeding was come on also, and the earliest ripe seeds had dispersed themselves, and produced an assurance of a larger crop for succeeding years than the most careful plucking of the present crop could destroy.

But if these were the difficulties which attended my attempts to eradicate those *seagrims*, which had happened not to be mowed, I was much more embarrassed by those which had been; for here it was impossible to get any such fast hold, as to pluck them up with *much*, or even *any* root.

I now applied myself to enquire what *gentlemen* or *farmers* were plagued with this weed, and what methods they had tried with success to destroy it.

I was told by a gentleman in my own neighbourhood, that Sir G. Cayley, of *Brompton*, near *Scarborough*, Bart. had been plagued with this weed, and had pursued the method of plucking with success.

Animated by this assurance, I resolved to pursue this method with great attention; and as it seemed to be a work which required great care, both in the choice of *season* and *manner* of plucking, I resolved not to depute the work to others, but to endeavour to clear a spot in my cow-pasture with

* *Lucit opes animusque ferro.* HORAT.

with my own hands, that, if my labour succeeded, I might employ others to follow the same method under my own eye in the rest of this pasture.

Accordingly, in the evenings of the *summer*, or rather *autumn*, of 1762, after showers, I applied myself to this work; and by help of a pair of strong gloves, and a tight grasp, I brought up *almost every* root, in a space of about two hundred yards square, whole; so that I had good hopes I should see this spot clear in the succeeding summer. It is true, I saw leaves of the species of this weed, and of a very vivid green too, around the plants which I pulled up; but as I *reasonably concluded* these to be fed by the taws which spread themselves from the main root, so I (methought *reasonably*) *concluded* also, that this main root being destroyed, the side taws would die, and consequently these young leaves.

But how was I disappointed, when, in the summer of 1763, I saw this spot of ground as much over-run with *seagrims* as any part else of the pasture which had been unpulled!

Conversing, however, with *G. Watson*, of *New Malton*, Esq; towards the latter end of summer, on this subject, I was assured by him, that by a repetition of this labour of plucking for some years, he thought he had lessened the number of his *seagrims*, though they were still numerous. Urged by this example, I have gone through the whole of my pasture, which is about ten acres, and keeps five cows, at the latter end of last summer, of 1763, with the same care as was used to a small part of it in 1762; yet am I not elated with much hope of success; for a little plot before my garden (in which my horses run, and which was managed with still more accuracy on account of the odious appearance of the *seagrims* from my windows) seems to threaten another considerable crop.

As I did not confine my enquiries about the method of destroying this hateful weed to any one rank of men, I was told by an honest quaker, a farmer in my neighbourhood, that he had found turning of sheep in winter
into

into his cow-pasture the only effectual method of destroying his hateful weed.

I thought this method very likely to succeed; for sheep are such close eaters, that I have known them destroy whole beds of the rankest docks, which could not be killed by any other means.

I have not been able to try this experiment considerably; for, as I am raising quick fences, both in my meadow and pasture, I keep no sheep. I have, however, occasionally admitted some of my tenant's sheep into the small plot before my garden this winter; and, upon an accurate examination this morning, I do not entertain any sanguine hopes of great success from this method. I find that many of the young leaves of this weed, now level with the surface of the ground, are untouched by the sheep; and that such others as appear bitten by them, do not seem in a dying condition.

The truth seems to me, that sheep, though they may not have the same aversion to this weed as horses and cows, yet are far from being fond of it; and if any great success is to be hoped for from their bite, (which may prepare beds for the water, and so decay the root) the sheep should be folded pretty close upon it, and obliged to eat it near, and at such a season that the winter-rains may have time to work its destruction. And such a method, if carefully pursued, seems to be most probable for the extirpation of this pernicious weed.

If the method of plucking is followed, I would subjoin some cautions.

First, In order to prevent the large plants from seeding, I would advise to cut off all the tops, and the tops only, when the flowers begin to die, that then good hold of the stalk may be gotten.

Secondly, I would defer the plucking till the rains have moistened the ground sufficiently to bring up the whole main root.

Thirdly, I recommend striking the root so brought up against the ground, in order to disperse the earth which adheres to it, by way of manure.

Fourthly, I always pile the plants thus pulled up and cleansed from earth, that, if the season prove favourable, they may be burnt, and the ashes arising from them spread on the ground; or if this cannot be conveniently done, (though it is much the better method, and may, with a sufficient fire, be done when they are ever so green) left to rot and manure the soil.

The grossness, and even stench, of this weed, is a proof of the great quantity of salts it contains; and in the same proportion as any plant exhausts the ground of its salts, it repays when reduced to manure. There can, however, be no question, but whilst weeds are left to rot, a great quantity of the salts, which by burning would mingle with the soil, are carried into the air.

I suppose, gentlemen, you will be curious to know in what manner I account for the sudden appearance of *seagrims* in vast abundance, in this estate, where they were hardly ever known before.

I will give you an account, which, I dare say, you will esteem perfectly satisfactory. About eight years ago I undertook to improve a piece of ground of about fourteen acres, which was over-run with thorns of both sorts, brambles, broom, and furze.

When I had got it cleared of all this trash, my next business was to pare the hills off, and pile them, and, after a winter's mellowing, to break and spread them with a mixture of lime, and all other kinds of manure which I could collect. As the soil was very poor, having been exhausted by the great quantity of trash it had nourished for many years, I was not yet satisfied, but resolved to take the advantage of the first dry summer, to lead out the riches of a pond of about thirty yards long and half as many broad, which had been occupied by a great number of geese, &c. and never thoroughly cleaned during near thirty years. I got through this work, though at a great expence, being obliged to employ a considerable number of draughts, lest the rains should make the mud too thin, or the heat bake it too much, the mud being for a considerable space a yard perpendicular.

All this mud I laid on my newly-improved ground, except a few cart-loads, which were brought and laid by the wall of a kitchen-garden, to be mingled with the other soil.

I had divided my improved ground, reserving about four acres for meadow.

Behold! the succeeding year gave me a crop of *seagrims* both in my new meadow, my new cow-pasture, and the plot of ground in which the mud for my garden had been scattered; and more particularly in those parts where the ground had been broke, either to stub the thorns, &c. or to take away the hills, while the adjoining ground on every side was free from this pernicious weed.

As I knew little or nothing of this weed, I suffered it to seed before I took any necessary precautions for its destruction. The succeeding year presented me with a much larger crop, and I have been ever since struggling for its extirpation, and have the mortification to see its incroachments on adjoining grounds by the seeds which winds have carried.

This fact, and another of the same kind, in a piece of ground which I improved since, at some distance from the former, have confirmed me in an opinion, which I before thought very probable, *viz.* "That all soils are originally
"impregnated with the seeds of almost all grasses and
"weeds, (though of some in greater quantities) which
"only want a proper stirring and manure to awaken them
"to vegetation, though at the expence of one another,
"some being suffocated by that process which gives life
"to the others."

I will add another striking instance in confirmation of this sentiment, notorious in this neighbourhood.

A considerable quantity of the park at *Gilling* was overrun with brakes and moss, and that wretched grass which grows in such company. Lord *Fairfax*, the owner, finding that he could not have his venison fat as it ought to be, destroyed his park, and applied himself seriously to the improvement of it at a vast expence. In course of

time by due tillage he brought this worst part of it to be not only good corn-land, but even *tolerable*, though *coarfish*, meadow and pasture; yet both of them thick set with *seagrims*, a weed never seen there till the quantity of lime which his lordship put into that poor soil had warmed it sufficiently.

I have only to add, on this subject, that I am persuaded *seagrim* does more harm in *meadow* than *pasture* land; for in the *latter* it only exhausts the ground, on which it stands, to no good purpose; but in the *former* it communicates its disagreeable stench in the sweat to the good hay, and destroys its sweetness. I advise, therefore, that hay-makers be ordered to throw it with their rake-shafts out of the swathe whenever they meet with it.

I am, GENTLEMEN,

Your constant reader, &c.

East-Newton,
March 16, 1764 *.

THO. COMBER, jun.

P. S. The species of *seagrim* are, perhaps, *as many* and *as various* as those of any plant whatever, arising from the variety of soil, age, moisture, &c.

I observe, that *seagrim* thrives chiefly on dry soils; infomuch that I ascribe the *little* or *no* appearance of this weed in this season to the long preceding rainy ones; and I have noticed, that on the draining of lands, this weed, never appearing before, has made its appearance. In short, every thing which gives true improvement to ground, encourages this weed; and therefore it deserves particular attention, as it is provoking to have our expences productive of what is pernicious.

* This letter is the first of a packet long missing, but at length come to the hands of the editors, which is the reason of its being dated so long ago as the spring of the last year. E.

N U M B E R XXV.

Of Housing great Cattle.

GENTLEMEN,

AMONG the advantages attending the late changes in management of farms in this part of the world, I must rank those which arise from housing of great cattle, by which name I understand cows and oxen.

The practice has long been in vogue with those who had only *one* or a *few* cows; but I remember when those who had many never thought of such a practice with regard to their herds, though they occasionally used it with respect to particulars.

However, the obvious advantages resulting from the method, with regard to a *few* cattle, has induced our farmers to adopt it with respect to *more*; yet is it not so generally followed as it ought, and by many, otherwise sensible, men is even held *problematical*.

I shall therefore, gentlemen, in this letter enumerate all the objections which have been, or can, I think, be made to the practice, give answers to them, and then display its advantages.

The objections to this practice are,

1. "It renders cattle more tender."
2. "It consumes much more fodder."
3. "It requires much more attendance."
4. "It is very expensive in building of houses, leading home of hay, and leading out of manure."
5. "It is wasteful of manure."
6. "It is not so healthy as lying out, which gives exercise."

As to the first, it is acknowledged, that a cow used to the house will suffer much more than one not used to it, if left out of doors. But this method supposes them to be housed from the first colds and rains at the beginning

of winter, to the true spring weather, when pastures are broke at *May-Day*; so that this objection only amounts to an assertion, that animals which are used to proper care, will, if neglected, suffer more than such as are used to be neglected; an assertion which, if it proves any thing, proves that we should neglect all our domestic animals. But, to shew the degree of tenderness to which great cattle will be subject by the housing I recommend, I must observe, that all the housing I would wish them to have should be a good cover over head, and a defence from the *northern* and *easterly* winds, and perhaps the *westerly* ones in this country, as they blow cold in spring, when the cattle lose their hair: but I would chuse to have my cow-houses open to the south.

Now what degree of true hardiness cattle can derive from lying with their sides on wet ground all night, and having their ridges (well known to be tender, and the source of many maladies) exposed to all the rain, &c. of a whole winter, and their feet and legs benumbed in wet grounds continually, I leave any man of sense to determine.

The generally-wretched condition, in spring, of cattle which have lain out, compared with the good plight of those which were in equal circumstances at the beginning of winter, but have been housed and fed with the same hay, will shew how ridiculous it is to object tenderness to the practice of housing.

White cattle are universally allowed, and, I think, with reason, to be more tender than the *red*, *brown*, or *black*. Now the breed of cattle in this part of the world is notoriously run into the *white* and *whitish*; so that the argument for housing is much stronger with us, while the breed continues in this strain, unless we will kill our cattle for fear of tendering them.

As to the second objection, it is acknowledged that housing consumes more fodder; but then we must consider how far it is a just objection to the practice. Now, it is obvious, that if cattle are to be kept not only *alive*,
but

but *well*, and in condition to be useful in spring and summer, they must have their bellies well filled. The only question then is at present, with what their bellies will be most advantageously filled, whether with *hay alone*, or with *hay and winter-grass*?

Now, any person, who knows any thing of the matter, must acknowledge, that winter-grass is one of the best manures that can be bestowed on meadow-ground, as it keeps the roots of the grass much warmer than any other manure which lies not so compact can do. But winter-grass having lost its genuine juices, and being in a state of corruption, must be, on many obvious accounts, the worst food which can be given to animals that are to yield milk, or to work in summer, therefore the worst food for cows and oxen: so that he who eats off his winter-grass, eats his crop of hay for the succeeding year to fill the bellies of his cattle with bad humours; and if this be a prudent saving of fodder, then is housing of cattle bad husbandry.

I must also here observe, that the quantity of hay trod under foot, spoiled by rain and the dung of the cattle, and scattered abroad by winds, is not inconsiderable; so that if this be added to what lying-out cattle *really eat*, we shall find the difference betwixt the quantities consumed by them and an equal number of housed cattle not nearly so considerable as may at first be thought.

The third objection seems more specious, but will be found equally inconclusive.

The taking away of the dung from the cattle, the driving of them to water and back again, are circumstances of attendance avoided, to be sure, by letting cattle lie out; but they are not really very considerable, and abundantly recompenced by other circumstances of attendance which are saved. The man who houses his cattle properly, will contrive to have a pond near his cow-house. To this the cattle will soon go of themselves, and as regularly return. In the mean time the dung is moved, and the stalls (or bouses, as we here call them) are
filled

filled with hay from the neighbouring stack by almost any boy, or woman on occasion. And so much attendance is saved by this practice of housing, both to the milk-maid, who has only to step into an adjoining dry house instead of a wet and distant close, and to the man-servant, who has not his fodder to bear to cattle in distant and wet grounds, and to disperse over these grounds, that it is well known to be one of the first enquiries which both men and women servants make at the time of hiring, “Whether the master who treats with them houses his cattle?” and he who does house them, may always hire servants considerably cheaper than others, who do not, can; as servants, who know the slavery of attendance on cattle lying out, will hardly hire at any rate to such as do not house their cattle, if they can hire to such as do.

The masters also find so much time saved by the less attendance on cattle housed than those which lie out, that they can even dispense with fewer servants, both men and women, in winter, than they could otherwise; so that the saving of attendance by housing of cattle, may justly be considered as a balance to the leading home of hay, and leading out of manure.

Much expence of molding is also saved; and cow-dung being only in a state proper for breaking, when neither *very wet* nor *very dry*, the season is often not favourable for this work; and by this means what should *manure* the ground, goes to the fire, as in some counties the *slovenly foolish* farmers designedly convert their cow-dung to this use. *Foolish* I may justly call them, if they can have any other fuel; *unhappy*, if they cannot.

The fourth objection is already in a manner *anticipated* and *answered*; for the buildings necessary to answer the purposes of housing of cattle are nowise expensive. Few farmers want a south wall of some kind: against this let them erect a kind of helm of any coarse wood, and wind the *eastern* and *western* ends with thorns or furze, if stones be scarce. Let them cover it with a few waggon-loads of furze, broom, or heath; and if they thatch it slightly,
it

it will last many years. The stalls, as they are kept dry, may be made of any offal wood; and the channel for a conveyance of the urine of the cattle, is soon laid with coarse stones. The leading home of hay may be made not very expensive, by putting it in the field into load pikes, and stationing these so that the waggon shall make as few tracks as possible, the pikes themselves being made by a single horse's leading in the cocks with a sledge, or rather a rope.

As vacant seasons for leading out the manure may be taken, this, though the chief, will be no *great* expence; and probably the attendance saved in winter and spring will be a balance, both to the expence of leading home hay in *autumn*, and leading out manure at a proper season; especially if the farmer judiciously contrives to have his meadow-ground as near home as possible; and if he cannot have this, his winter attendance on lying-out cattle will be proportionally greater.

But if it should be thought that the saving of attendance in winter and spring is not an equivalent to the expences incurred by housing of cattle, and enumerated in this objection, yet this saving is *considerable*; and the advantages which I shall enumerate in the close of this letter, must be thought to be a great over-balance to any expence incurred by it, in the opinion of judicious men; especially as a cow-house once built stands many years, and a draught has little other work, betwixt the *autumnal season* and *depth of winter*, than to lead out manure, or, in the hay-harvest, than to lead the hay home.

I would have manure led out as soon as the first fogg or aftermath is eaten.

The fifth objection is grounded on a supposition that the manure which is made by housed cattle, when turned out in the day-time, is lost. But to this I answer, that the cattle are generally either turned into a yard or field, in the day-time: in the former case, the manure is easily shovelled up at a proper season, and carried out in the same way as the rest; or, in the latter case, it is spread

on the ground where it is made, so that there is little or no loss of it.

Indeed, people who agree in the point of housing of cattle, differ in their sentiments about managing of them in the day-time; some keeping them continually in the *house*, or at least *yard*, except the time of watering; others turning them out to graze by day: and the different circumstances of people will make these opposite methods of management equally prudent.

For instance, where manure cannot easily be gotten, it will be adviseable for people to take particular care of all that is made by their great cattle, as they have nothing else for their tillage. On the contrary, where people have plenty of other manures, and are at a distance from water, it is adviseable to let their cattle wander on to moors, where they may brouse on the heath or furze, or such like.

This is the constant custom of the inhabitants of all the moors above this place. They have plenty of lime for their tillage, by the coals and lime-stone near them, and of manure for their meadows by their turf-ashes*. They have little enclosed ground, and this they preserve as free as they can in winter; otherwise the coldness of their situation, and lightness of soil, if they eat it bare, would deprive them of all hopes of a crop in the succeeding summer; their cow-pastures, with all advantages, being scarce able to keep their small cows in *June*.

These people in winter turn their cows into their town-street, whence they all march to some common pond adjoining to their commons, where they brouse all the day, and return of themselves at night to their stalls. By these means, with very slender crops of hay, they keep their cattle in very tolerable plight.

As to the last objection, lying out exposes cattle to such colds as produce many distempers, and is utterly inconsistent

* We should be much obliged to Mr. Comber if he would communicate to us the method of making and using turf-ashes in Yorkshire. E.

consistent with their health, except in very favourable winters. But if the farmer really thinks that his cattle want exercise, he may turn them out in the best part of the day into his driest ground; yet I am myself convinced, that till spring approaches, cattle get much more harm than good by *staying* out. *Standing out* is not exercise, and cattle turned out in unfavourable weather *stand* rather than *walk*; and cows which lie out, stand too much, unless hunger oblige them to walk in search of food.

I will now, gentlemen, very briefly display the advantages which result from the housing of great cattle.

In the first place, by this means the meadows are winter-freed, and the best assurance of a good crop of hay is laid.

In the next place, the injury done to the soil by the treading * of great cattle is avoided.

In the third place, the carcases of the cattle are kept in much better plight.

In the fourth place, the cows give *much more* and *better* milk, and *longer*.

In the fifth place, the cows avoid many disasters in calving, and are then attended with great ease.

In the sixth place, the calves are found to be *stronger* and *livelier*.

In the last place, the manure is laid on such grounds, and parts of grounds, as most want it, and in any proportion, and with any mixture the owner pleases; whereas it is notorious, to the sorrow of every prudent farmer, that cattle lying out manure chiefly the ground which lies under hedges, and wants it not, and by its irremediable coarseness never pays for that manure.

I must add, that there is no comparison betwixt keeping of oxen in a fold-garth, and keeping of them tied up like milch-cows.

S 2

For,

* I once saw a *small* close of very rich soil in this neighbourhood, so trodden by *very large* fat oxen, in a wet winter, that though half the hay was buried under their feet, and the next summer a moderate one, there was *absolutely* no crop. The oxen weighed about one hundred stone each. COMB.

For, in the first place, much mischief is often done by the oxen to each other, when promiscuously turned into a fold-yard, and especially to the younger and weaker.

Secondly, They all lie exposed to the wet from heaven, and consequently to the same evils, in some degree, as when they lie out.

Thirdly, As the fold-garth is the sink of all their urine, they often lie wet.

Lastly, The waste of straw which is made in a fold-garth is incredible.

Were straw of no other value than to make manure of, the steeping of it thus in the urine of the oxen would be a judicious method : but it may always be made of much more value. When kept clean, the straw will maintain a much greater quantity of cattle ; and if there be less manure it will be better, and there will be much more profit from the carcases of the cattle. I know a farmer who last winter took in four oxen for twenty weeks, at two shillings *per* head each, that is, eight pounds. These were in a fold-garth. I believe it is no unreasonable * supposition, that the straw trod under foot by these oxen would have kept other two oxen if tied in the stall ; that is, would have given the farmer four pounds more,

I am, GENTLEMEN,

Your constant reader,

And an hearty friend to your undertaking,

East-Newton,

THO. COMBER, jun.

March 17, 1764.

P. S. The inconveniencies which attend fold-garths begin to be now so well known, that a tenant on this estate

* Let the reader consider, that whatever straw is either thrown by the stand-hecks, through negligence or incapacity of the sower, or accident, or the wantonness of the oxen, being once mixed with the soil, or trod under foot, becomes uneatable, all animals having an aversion to what smells of their own urine. Let him also reflect how much short straw, equally eatable with the rest, is lost, and he will probably think that I calculate very modestly. COMB.

estate, of a farm of two hundred pounds *per annum*, who milks above twenty cows, and breeds in proportion, has not a single fold-garth. If they are any where adviseable, it is where a large quantity of beans are grown, the straw of which being scarcely fodder for any cattle, is best wrought into manure in a fold-garth. But even in this case, the straw may serve for bedding in stalls, and the inconveniencies attending all fold-garths seem greatly to preponderate.

NUMBER XXVI.

A Letter from James Crokatt, Esq; to the Editors.

GENTLEMEN,

I Herewith inclose you a letter from John Lewis, Esq; * of Tracey, near Honiton, in Devonshire, concerning the culture of burnet-grass, &c. which, in my opinion, contains the plainest and most complete directions of any published on that subject; and as I believe it will be of service to your readers, if you are of the same opinion, as I have his liberty, so you have mine to print the same in your *Museum Rusticum*. Be so good to return the original letter as soon as conveniently you can to,

GENTLEMEN,

Your most humble servant,

Luxborough,
Near Woodford-Bridge, Essex,
August 12, 1765.

JAMES CROKATT.

* We are infinitely obliged to Mr. Crokatt for communicating to us Mr. Lewis's valuable letter, and hope frequently to receive from him such favours. E. O.

NUMBER XXVII.

*A Letter from John Lewis, Esq; to James Crockatt, Esq;
relative to the Culture of the Burnet-Grass.*

S I R,

I Am now to acknowledge the favour of yours of the twenty-second of February, desiring me to acquaint you what is the best soil for burnet, the quantity to be sown *per* acre, the proper time for sowing it, the method of sowing it, and the time of feeding on it; in which I could only partly inform you till now, as I shall add the harvesting it, and its produce; which will give you and every gentleman else, inclined to cultivate this valuable grass, a true, and, I hope, clear idea of its utility; and if you think it worth the notice of the public, you are welcome to make what use you please of it.

First then, the dry deep soil is the best for this grass, as it runs down in a spill like a young carrot, six and eight inches, and sometimes more deep; though a moist soil will do, but not too wet, and should be well fallowed, and made to a fine tilth.

I had of Mr. Rocque last year seventy-two pounds of seed, at two shillings *per* pound, which sowed six acres; in August and in September it came up tolerably thick; in October it almost covered the ground, and at Christmas I had a fine crop, which gave a most delightful verdure, beyond any thing I ever saw.

It kept on vegetating till the latter end of February, when it was thick, and about nine inches high; but at this time the constant rains prevented my stocking it, as we term it, that is, feeding it; for my ground was so wet, that my cattle were over hoof; therefore I was obliged to take them out, and let the field lie for mowing, having several wet swampy places in it.

I therefore

I therefore let it rest till the first of May, when I mowed two acres for fodder, just at the time it was in full bloom, which is a of a fine purple hue, and, considering the dryness of the season, had a good swarth, which was well made, and is, perhaps, the best hay that can be produced, especially for horses.

About ten days since, I mowed this a second time, but cannot boast of my crop, for it has not rained since the first mowing; however, I believe it is more than if it had been clover, or any other grass.

The remaining four acres which I left for seed, I mowed the middle of June, and had, considering the season, a fine swarth as I should ever desire, besides my seed: it lay two days in the swarth, which I turned once, and then had it lightly threshed on gates laid on winnowing-sheets on the ground, to receive the seed, and then put my hay in a rick, than which I think nothing can be better, leaving, as I suppose, one third of the seed in the hay; and I have of clean fine seed (much better than what I bought of Mr. Rocque) one thousand pounds weight, which I sell at an hundred *per cent.* less than I bought it, and yet there remain great gains; and my burnet now looks greener, and vegetates faster, than any ground around me, even than my meadows, which are very good ones; and should it please God to bless us with rain soon, I should have a surprising crop again.

I have sold as yet but thirty pounds of seed, the price one shilling *per* pound; and I propose sowing twelve acres this season myself; yet I cannot persuade the farmers round me to follow the example laid before them; such is their obstinacy to any thing new, and attachment to to their old practice, let it be ever so absurd.

As I said before, I shall sow twelve acres of burnet the latter end of this month, or the beginning of September: my ground is a heavy marly loam, too much inclined to wet in winter; therefore I think the piece of ground you mentioned is preferable to mine for burnet.

It

It should be ploughed as deep every ploughing as the ground will admit of. I have not trench-ploughed my land, as Mr. Rocque advises to plough in the same furrow twice: mine is now ploughed three times, and the fourth time I shall sow my seed the round-cast way, as we sow any other grain; and I shall sow fifteen pounds *per* acre, judging, by my last crop, that it cannot well be too thick, as it must support the plants, when young, in severe frosts the better, and the crop of hay be proportionably larger.

Prepare your land as you would for a crop of turneps, and harrow it in with a light brush-harrow; then roll it, and you need not fear a good crop: keep it clean from weeds before Christmas, and eat it not till the beginning of March, for fear the frost and rains should hurt the plant, by entering the tubes of it, and thereby injure the heart, and stop its growth. You may eat it till the beginning of May; and, if the weather be favourable, you will have a good crop of hay and seed the beginning of July, and not before; Mr. Rocque says in June, but he is mistaken*: upon the whole, Sir, I do not know any grass that answers so well, or turns out so much to the advantage of the farmer.

I have had this season twelve acres of the Dutch honey-suckle grass, sown with rye-grass; but it is nothing to the burnet.

I bought of Mr. Rocque sixteen pounds of timothy-seed last autumn, and sowed it, as directed by him, in September; two acres in wet ground, one acre in moist ground, and the remaining acre in dry ground, all a fine fallow and good ground: very little of it came up at all, and it was so very bad in each sort of land, that I was obliged this spring to sow it to oats. In short, it is a mere nothing; for we have the same grass growing in our coarse meadows, under the name of fox-tail grass †.

I have

* The burnet Mr. Rocque sows is certainly ripe in June. E.

† We can venture to assure Mr. Lewis, that the true timothy-grass is really valuable, and on a moist good soil will amply repay the

I have compared it, and find it the same; and so has a gentleman near me, who also sowed four acres of timothy, four pounds *per* acre, at five shillings *per* pound; and his came to nothing, like mine.

I am, SIR,

Your most obedient,

Tracey, near Honiton, Devon,

JOHN LEWIS.

August 4, 1765.

N U M B E R XXVIII.

An Account of the Prices of Wheat, and some other Articles of necessary Provisions, at various distant Periods of Time; with some reasonable Deductions therefrom.

GENTLEMEN,

MANY people seem to be of opinion, that agriculture has been very little improved since the times in which the Romans flourished. They say that the Virgilian husbandry was at least as perfect as that which is now practised; and that the Romans were moreover acquainted with many excellent practices which are now entirely lost, and may, perhaps, never be recovered.

That the Romans were knowing in matters of husbandry no man in his senses will attempt to deny; yet do I see no reason to conclude that they were more knowing in these matters than a very great number of practical husbandmen now living.

VOL. V. NO. 24.

T

It

the farmer the expences of cultivation. The timothy is essentially different from the genuine fox-tail grasses, though, as it is a native of England, it may in Devonshire be called by the common people fox-tail grass, on account of there being some distant resemblance between the timothy and the meadow fox-tail. We have compared them together in their flowering state, and the difference was very striking; it is pretty well preserved in the delineations inserted in our Fourth Volume. The timothy is doubtless the *gramen typhinum*, or cat's-tail grass. E. O.

It is more than probable, that the crops we now raise of various kinds of grain are greatly superior, in point of quantity at least, to almost any raised by the Romans; yet would it be very difficult to ascertain this matter, for I know of no Roman writer who has, with sufficient precision for this purpose, delivered down to us the exact quantity of any kind of grain raised on any certain proportion of land; besides, we are too little acquainted, in fact, with the Roman weights and measures to form any exact judgment on this subject.

Let us then descend a little lower, and we shall find, on consulting our best historians, that from the Norman conquest to the last century, when the exportation of corn was encouraged, we had frequent famines, insomuch that wheat was sometimes so high in price, that the poor knew not the taste of bread; whereas, at other times, it would become so great a drug on the hands of the distressed farmer as to be sold for twelve pence the quarter.

Agriculture, in these circumstances, could not be flourishing: the farmer, when wheat was dear, could not afford to buy seed to sow his land, so that the next year it was of course dearer still; and when, by means of a very favourable season, it happened to be cheap, the farmer, whose wheat lay on his hands for want of purchasers, had neither heart nor spirit to sow for a new crop, when such quantities of wheat lay rotting in his granaries on account of the vile price for which it sold.

I think I can venture to assert, that all these scarcities and famines proceeded from agriculture not being sufficiently encouraged. The farmer could never promise himself a certain sale for his commodity; and it sometimes happened that his seed cost him more than a plentiful crop would sell for.

When the exportation of wheat was permitted and encouraged, affairs took a new turn: wheat was sold at a moderate and reasonable price, which seldom varied greatly from year to year; and as the prices of every thing were governed

governed by that of wheat, provisions of all kinds became cheap and reasonable.

You have already inserted in your work the prices of wheat and malt at Windsor market for a long series of years, which is very well worth the attention of your readers. I also find in your collection the quantity of wheat and other corn that has been at various times exported; and in another place you have the prices of sundry articles of provision, as contracted for at various times by the victualling-office. All these together give us a good idea of the alteration in price of many articles in different years, and are doubtless of great use. Let me recommend for insertion an extract from a pamphlet lately republished, in which your readers will find an account of the most remarkable dearths and famines which have happened in this kingdom since the Norman conquest.

It will be amusing, as well as useful, if your thinking readers would examine, in the English histories, the periods to which the following articles refer, in order to discover the immediate causes of these dearths, as in all probability they were governed by some preceding event. I have not time to do it myself. This account begins with the reign of William the Conqueror.

“ 1069. In the third and fourth yeare of the said king, by meanes of the Normans wasting of England in Northumberland, and other places in the yeare precedent, such a dearth encreased through all England, especially Northumberland, and the countries next adjoyning, that men were glad to eat horses, cattis, dogges, and mans flesh; for all the land lying betweene Durham and Yorke lay waste without inhabitants and people to till the ground for the space of nine yeares, except only the territory of Saint John of Beverlake.

1086. In the 21 yeare of William the Conqueror was a great dearth of cattell, and sore distemperature of the aire, so that many men died of feavers, and afterwards many others died of famine.

1093. In the sixt yeare of William Rufus was a great famine, and afterwards so great a mortality, that the living were scarce able to bury the dead.

1112. In the 13 yeare of King Henry the first there was a sharp winter, great dearth and mortality of men, with murraine of beasts of the field, and also of the house, and a great destruction of fowle.

1124. In the 23 yeare of the same king, by meanes of changing the coine, all things became very deare, whereof an extreame famine did arise, and afflict the multitude of the people even to death.

1177. In the three and twentieth yeare of Henry the second, The Black Book, containing the orders and rules of the Exchequer, was compiled; wherein, among other things, is mentioned, That for provision of the kings household, from the time of King Henry the first, the officers of the kings household reducing their victualls into an estimate of money, did value for a measure of wheat to make bread for 100 men, *xijd.* for the carcase of a fat ox, *xijd.* for a fat sheepe, *4d.* and for the provinder of twenty horses, *4d.*

1205. In the seventh yeare of King John began a great frost, which continued till the 22 of March, so that the ground could not be tilled; whereof it came to passe, that in the summer following, a quarter of wheat was sold in many places of England for a mark, (which, for the more part, in the dayes of King Henry the second, was sold for twelve pence) and a quarter of beans or peas for a noble, and a quarter of oates for *3s. 4d.* which were wont to be sold for *4d.*

1222. In the seventh yeare of Henry the third, on Holy-Rood-Day, was a great thunder and lightning throughout all England; and such great floods of water followed, with great winds and tempests, which continued till Candlemas, that the yeare following, wheat was sold for *12s.* the quarter, which is as much as *36s.* at this day. (In the beginning of the reign of Charles the first.)

1234. 18 Henry the 3. was a great frost at Christ-masse, which destroyed the corne in the ground, and the roots of hearbs in the gardens, continuing till Candle-masse without any snow, so that no man could plough the ground, and all the yeare after was unseasonable weather, so that barrenesse of all things ensued, and many poore folks dyed for want of victualls, the rich being ~~to~~ bewitched with avarice, that they could yeeld them no reliefe. Amongst whom Walter Gray, then archbishop of York, was not least covetous, of whom it is recorded, that his corne being then five yeares old, hee doubting the same to be spoild with vermine, did command that it should be delivered to the husbandmen that inhabited his mannours, upon condition that they should pay him the like quantity of new corn after harvest, but would give none to the poore for Gods sake; whereupon it came to passe, that when men came to a great stack of his corne, which stood nere the towne of Rippon, there appeared in the sheaves all over the same the heads of wormes, serpents, and toads; besides, a voice was heard out of the cornemow, saying, *Lay no hands on the corne, for the archbishop and all that hee hath is the devills.* To conclude, the bailiffes were forced to build a high wall round about the corne, and then to set it on fire, lest the venemous wormes should have gotten out, and poysoned the corne in other places.

How this bishop died I have not read, and whether he went to God or the devill it is not for me to determine.

1248. 32 Henry 3. by reason of embasing the coine a great penury followed.

1258. 43 Henry 3. A great dearth followed the wet yeare past; for a quarter of wheat was sold for 15s. and 20s. but the worst was in the end; there could be none found for money, where-through many poore people were constrained to eat barks of trees, and horse-flesh, but many starved for want of food, twenty thousand (as it was said) in London.

1288. In

1288. In the sixteenth yeare of Edward the first, the summer was so exceeding hot, that many died through the extremity thereof, and yet wheat was sold at England for three shillings foure pence the quarter.

1289. 17 Edward 1. Great haile fell in England, and after ensued great raine, that the yeare following wheat was raised from 3*d.* the bushell to 16*d.* and so encreased yearely, till it was sold for 2*s.* 6*d.* the bushell.

1295. In the 23. yeare of Edward the first, the king caused all the monasteries in England to be searched, and the money found in them to be brought up to London, Hee also seised into his hands all their lay fees, because they refused to pay him such a tax as hee demanded. Moreover, hee caused the wooll and leather to be stayed in England; and there followed great dearth of corne and wine.

1298. 26 Edward 1. was a great famine in England, chiefly want of wine; so that the same could scarcely be had to minister the communion in the church.

1299. 27 Edward 1. An act of common counsell was made for prices of victualls to be sold at London by consent of the king and nobility, viz. a fat cock for 1*d.* 6*b.* two pullets, 1*d.* 6*b.* a fat capon, 2*d.* 6*b.* a goose, 4*d.* a mallard, 1*d.* 6*b.* a partridge, 1*d.* 6*b.* a pheasant, 4*d.* a heron, 6*d.* a plover, 1*d.* a swan, 3*s.* a crane, 12*d.* two woodcocks, 1*d.* 6*b.* a fat lamb, from Christmasse to Shrovetide, 6*d.* and all the yeare after for 4*d.*

1314. In the eight yeare of King Edward the second, the price of victualls being so excessive, that the common people were not able to live, By parliament at London, 3. February, it was ordained, and the kings writs were published for prices of victualls not to exceed as followeth, viz. an ox stalled or corne fed, 24*s.* a grasse fed ox, 16*s.* a fat stalled cow, 12*s.* another, 10*s.* a fat mutton corne fed, or whose wooll is well growne, 20*d.* another fat mutton shorn, 14*d.* a fat hog of two yeares old, 3*s.* 4*d.* a fat goose, 2*d.* 6*b.* in the citie, 3*d.* a fat capon, 2*d.* in the citie, 2*d.* 6*b.* a fat hen, 1*d.* in the citie, 1*d.* 6*b.* two chickens,

chickins, 1*d.* in the citie, 1*d.* ob. foure pidgions, 1*d.* in the citie, three $\frac{1}{2}$ *d.* 24 eggs, 1*d.* in the citie 20, &c. Neverthelesse, all things were sold deerer than before; no flesh could be had, capons and geese were not to be found, eggs were hard to come by, sheepe died of the rott, swine were out of the way; a quarter of wheat, beanes, and peas, was sold for 20*s.* of malt for a mark, of salt for 35*s.* &c.

1315. 8 Edward 2. The king in parliament at London revoked the provisions before made for selling of victualls, and permitted all men to make the best of their owne. Neverthelesse, the dearth encreased through the abundance of raine that fell in harvest, so that a quarter of wheat was sold before Midsummer for 30*s.* and after for 40*s.*

There followed hereupon a grievous mortalitie of people, so that the living might hardly bury the dead. The beasts and cattle also through corruptnesse of the grasse whereon they fed, died. Horse-flesh was accounted great delicates. The poore stole fat dogs to eat. *Those doggs became fat by feeding on the beasts and cattell that died.* Some others in hidden places did mitigate their hunger with the flesh of their owne children. The thieves that were in prison did pluck in peeces those that were newly brought in amongst them, and greedily devoured them halfe alive.

The Londoners, the same yeare considering that wheat was much consumed by the converting thereof into mault, ordained, that from thenceforth it should bee made of other graine, and also that a gallon of the better ale should be sold for 3 halfe pence, and of small ale for one penny, not above.

The king, according to the statute of London, sent his writs through the realme, commanding that in cities, borowghes, townes, and villages, as well within the liberties as without, a gallon of ale should bee sold for one penny. And that from thenceforth, no wheat should be made into mault; which if he had not the sooner caused to be proclaimed, the greatest part of the people should have perished through famine.

1317. 10 E. 2. The harvest was early, so that all the corne was inned before Saint Giles day, being the first of September; a bushell of wheat, which before was sold for 10s. was then sold for 10 pence; and a bushell of oates, which before was sold for 8 shill. was then sold for 8 pence.

1329. In the third yeare of Edw. the third, a statute was made, prohibiting the importation of wheat, rye, or barley into this realme, unlesse the price of wheat exceeded 6. shill. 8 pence the quarter, of rye 4. shill. of barley 3 shill. at that port or place where the same should bee brought in, upon paine of forfeiture thereof.

1330. 4 E. 3. The summer was so wet with abundance of rain, that the corne could not ripen; so that in many places they began not harvest untill Michaelmasse; the house of Craxton got not in their wheat till Alhallontide, and their peas not before Saint Andrewes tide. The monks on Alhallonday and Martinmas day were served with peas greene in the cods, instead of peares and apples.

1355. 27 E. 3. The dearth of corne by them of Ireland, and the Irishmen that brought in corne to sell unto divers havens of this realme, was asswaged to the great reliefe of the people.

1358. E. 3. A great dearth with pestilence happened in England, which was called the second pestilence.

1369. 43 E. 3. Was a great dearth of corne, so that a bushell of wheat at London was sold for 2 shill. 6 pence, of barley for 20 pence, of oates for 12 pence.

The occasion of this dearth might be supposed the excessivenesse of a feast in the yeare before, where the meats that were brought from the table, would sufficiently have served ten thousand men.

1379. In the third yeare of Richard the second, a bushell of wheat was sold for 6 pence, a gallon of white wine for 6 pence, of red for 4 pence.

1387. 10 Rich. 2. In the beginning of the yeare, at Leicester, 100 quarters of barley were sold for 100 shillings.

1391. 15 R. 2. Dearth of corne now almost continued for two yeares, whereby it came to passe, that when the time of fruits, as nuts, apples, plummcs, pearcs, &c. was come, many poore people through over-feeding thereof died of the flux. And if the commendable care of Adam Baume, then major of London, had not relieved the commons, who continually provided, that from the parts beyond the seas, corne was brought to London to the reliefe of the whole realme, where otherwise without doubt neither had the country sufficed the citie, nor the citie succoured the country.

To the furtherance of which good work in relieving the poore, the major and citizens of London took out of the orphans chest in their Guildhall, 2000 marks to buy corn, and other victualls from beyond the seas; and the aldermen each of them layd out 20 pound, to the like purpose of buying corn, which was bestowed in divers places, where the poore might buy at an appointed price, and such as lacked money to pay downe, did put in surety to pay in the yeare following, in which yeare, when harvest came, the fields yeelded plentiful encrease, and so the price of corne began to decrease.

1438. In the 17 yeere of Henry the sixt, by meanes of great tempests, unmeasurable windes and raines, there arose such a scarcitie, that wheat was sold in some places for 2 shillings 6 pence the bushell.

1439. 18 H. 6. Wheat was sold at London for 3 shillings the bushell, mault at 13 shillings the quarter, and oates at 8 pence the bushell, which caused men to eate beanes, peas, and barley, more than in an hundred yeeres before; wherefore Stephen Browne, then maior, sent into Pruse, and caused to be brought to London many ships laden with rye, which did much good; for bread-corne was so scarce in England, that poore people made them bread of ferne-roots.

1454. 22 H. 6. Wheat and other graine were in such plentie, that a quarter of wheat was commonly sold for 12 pence or 14 pence; of mault, for 16 or 17 pence at the most. A certaine farmer dwelling in Cruse Royfie,

or Rosie towne, in Hertfordshire, sold twenty quarters of the best wheat for 20 shillings.

1486. In the second yeere of Henry the seventh wheat was sold at 3 shillings the bushell, and bay-salt at the like price.

1491. 7 H. 7. Wheat was sold at London for 20 pence the bushell, which was accounted a great dearth.

1494. 10 H. 7. Wheat was sold at the like price.

1521. In the thirteenth yeere of Henry the eight, was a dearth of corne, (with pestilence) for wheat was sold at London for 20 shillings the quarter.

1526. 18 H. 8. In November, December, and Januarie, fell such abundance of raine, that thereof ensued great floods, which destroyed corne-fields, pastures, and beasts. Then was it drie till the twelfth of April; and from that time, it rained every day and night, till the third of June; whereby corne failed sore in the yeere following.

1527. 19 H. 8. Such scarcitie of bread was at London, and throughout England, that many dyed for want thereof. The king sent to the citie, of his owne provision, six hundred quarters: the bread-carts then comming from Stratford towards London, were met at the Miles end by a great number of citizens; so that the maior and sheriffes were forced to goe and rescue the same, and see them brought to the markets appointed: wheat being then at 15 shillings the quarter. But shortly after, the merchants of the Stiliard brought from Danske such store of wheat and rye, that it was better cheape at London, then in any other part of the realme.

1553. In the first yeere of Queen Mary, at her majesties comming to the crowne, victuals were so plentiful, that a barrell of beere was sold for six pence, with the caske, and foure great loaves of bread for one penny.

1557. 5 Mary. Wheat was sold before harvest, for foure marks the quarter; but after harvest, for five shillings: so that a penny loafe, which weighed in London the last yeere but 11 ounces Troy, weighed now 26 ounces Troy.

1558. 6 Mary, Corne rose to 14 shillings the quarter.

1573. About Lammas, wheat was sold at London for 3 shillings the bushell; but shortly after, it was rayfed to 4 shillings, 5 shillings, 6 shillings, and before Christmas, to a noble, and 7 shillings; which so continued long after; yet there was no want to him that wanted not money.

1586. In the 29 yeere of Queene Elizabeth, about Januarie, her majestie observing the generall dearth of corne, and other victuals, growne partly through the unseasonableness of the yeere then past, and partly through the uncharitable greediness of corne-masters, but especially through the unlawfull and over-much transporting of graine in forreine parts; by the advice of her most honourable privie councell, published a proclamation, and a booke of orders to be taken by the justices, for reliefe of the poore; notwithstanding all which, the excessive prices of graine still encreased; so that wheat in meale was sold at London for 8 shillings the bushell, and in some other parts of this realme above that price.

1594. 36 Eliz. In May fell many great showers of raine, but in June and July much more, for it commonly rained day and night till Saint James Eve; and on S. James day in the afternoone it began againe, and continued for two dayes together. Notwithstanding there followed a faire harvest. But in September, great raines rayfed high waters, such as stayed the carriages, and bare downe bridges, as at Cambridge, Ware, and elsewhere. Also graine grew to be of a great price, a bushell of wheat at 6, 7, or 8 shillings, &c. which dearth happened more through the merchants over-much transporting, then the unseasonableness of the weather past.

1595. 36 Eliz. By the late transportations of graine into forreine parts, the same was here growne to an excessive price, as in some parts of this realme, from 14 shillings to 4 marks the quarter, and more, as the poore did feelee; and all other things whatsoever were made to sustaine man, were likewise rayfed, without all conscience and reason. For remedie whereof our merchants brought

back from Danske much rye and wheat, but passing deere; though not of the best, yet serving the turne in such extremitie. Some prentices and other young people about the citie of London, being pinched of their victuals more then they had beene accustomed, tooke butter from the market folkes in Southwarke, paying but three pence, were the owners would not afford it under five pence by the pound. For which disorder, the said young men were punished on the 27 of June, by whipping, setting on the pillorie, and long imprisonment.

1596. 37 Eliz. In August, September, October, November, fell great store of raine, and wheat in meale was sold at London for 10 shillings the bushell; yet through the diligent carefulnesse of Thomas Skinner, then lord maior, provision was made for corne to be brought from Danske, and other the east countreyes, by our merchants, unto whom was granted custome and stowage free, as also to make their owne price, or transport to any part of this realme. Whereupon it followed, were the price never so high, this citie never wanted corne for their money.

1597. And 39 Eliz. The price of wheat in London markets fell from 13 shillings to 10 shillings the bushell."

I would have your readers remark, that in the year 1289, wheat sold for three pence the bushel; whereas, in the following year, it was ~~raised~~ to sixteen pence, and continued raising yearly till it was two shillings and sixpence the bushel, an immense price, if we consider the value of money in those days. Again, in 1317, before harvest, a bushel of wheat sold for ten shillings; whereas, after harvest, it sold only for ten pence. In 1454, the best wheat sold for twelve pence the quarter. Again, in 1557, before harvest, wheat sold for four marks the quarter, but after harvest it fetched only five shillings, though the year following it rose to fourteen shillings the quarter. In 1573, about Lammas, wheat sold in London for three shillings the bushel, which quantity before Christmas was worth seven shillings.

I mention

I mention here these things in support of the arguments I have made use of in the former part of this letter, and doubt not but many of your readers will join with me in opinion that the state of agriculture is greatly improved, and that it cannot be too much encouraged, if we mean to have corn cheap and plentiful.

I am, GENTLEMEN,

Your very humble servant,

July 25, 1765.

CLERICUS.

N U M B E R XXIX.

*An easy Method of building Chimneys that will not smoke,
pointed out.*

GENTLEMEN,

I Know nothing that renders a house more disagreeable than bad venting chimneys. This inconvenience is complained of by many in almost every town; besides the pernicious consequences that attend it in regard to health, the smoke sullies and spoils linen and other cloathes, dirties and disfigures the furniture, rusts the metals, duns the complexion, and, in fine, the troubles attending it are universal; any one that has experienced what it is, can very well judge of the consequences.

Your *Museum Rusticum* being the best conveyance whereby a person may communicate his thoughts, I shall trouble you with this letter upon that subject.

Workmen have different methods for drawing up the funnel of a chimney, according to their own fancies and judgments, and sometimes according to the customs of places: they are seldom directed by sound rational principles.

It will be found, for the most part, that those which smoke are carried up narrower near the top than below, or where they go zig-zag all in angles: in some cases, indeed, it is owing to accidental causes, but, for the
most

most part, to those two above mentioned. Where they are carried up in the pyramid or tapering form, especially if the house be a considerable height, it is ten to one but that they sometimes smoke; for the air in the rooms being rarefied, is forced into the funnel of the chimney, and the fire causes another addition of force to drive up the smoke. Now it is evident, that the further up the smoke flies, the action of the powers is less; but in this case the resistance is encreased, by being gathered closer and closer together; whereas, instead of that, the less the forcing powers act, the less should be the resistance, or the smoke have more room while the force diminishes.

This method of carrying them up will be objected to by some thus: The wider it is at the top (say they) the more liberty has the wind to blow down. Very true; but is it not resisted in going down, both by the form of the chimney, and other evident causes, so that it returns again? In the contrary way, when the wind blows down, the resistance being less, the wind and smoke (if I may use the expression) are imprisoned, and make the smoke puff out below.

We were much troubled in my house with that bad companion, to remedy which, a great many things were devised by different workmen. A kind of a barrel was set upon the top of the chimney, and a vane to turn the vent side from the wind; but it did not answer expectation. About the grates, alterations were often made, in the methods commonly made use of, but to no purpose: the chimneys even pulled down to as little advantage, every workman pretending he could infallibly remedy it: one of them was made with crooks this way and that way, as if that would administer relief.

At last we were resolved to have it done in another way, and this appeared to be the only rational one.

We carried up the vent as perpendicular as possible, at least with no angles, made it about three or four inches wider at top than bottom; and I must add,
tha

that the funnel must be gathered in a throat directly above the fire-place, and so widened according to this direction.

This same method has been made use of several times since, and never failed.

What is remarkable, this house is situate directly under a high mountain, to the southward, from which we have strong blasts blowing down upon us, but do not now find any inconvenience from them. When the doors stand open, the draught is so strong that it will carry a piece of paper out at the head of the chimney.

I know that some of our best workmen follow this method, but it is far from being general: on this account, I choose to write to you my sentiments, if peradventure, it may be of any service.

I could wish to see some plans of farm-houses from some of your ingenious correspondents, the out-houses, yard, and other necessities, to be conveniently situate both for ornament and convenience, that they may collect the dung, &c. to the best advantage, and the houses conveniently modelled themselves; remaining,

GENTLEMEN,

Dumfries,
August 9, 1765.

Yours,
J. M. C.

N U M B E R X X X .

*On the Advantages of ascertaining the mean Weight of various
Kinds of Grain.*

GENTLEMEN,

A Correspondent of yours, (Vol. IV. page 198.) amongst other regulations concerning provisions, proposes that all grain (malt excepted, for the reason there assigned) should be sold by weight. In order to put that scheme in execution, it would be proper to fix
the

the standard weight of a bushel in such a manner as to bear a due proportion to what a bushel in measure containeth.

Warwicensis (Vol. II. Numb. LXI.) seems to have ascertained the weight of wheat with accuracy. According to his calculation, the *mean* weight of a bushel of wheat, (that is to say, of a bushel containing about twenty-eight cubical inches more than the Winchester, which he contends is so much too small for dry measure) is about sixty-two pounds averdupois.

The dealers in corn purchase wheat from farmers at sixty-four, but more frequently at sixty-six, and sometimes at seventy pounds *per* bushel. What an amazing gain! when the weight of *good* wheat appears (Vol. II. page 179.) to be no more, in *general*, than sixty-four pounds.

Your correspondent (Vol. III. page 43.) also computes the weight of a crop on an acre, at seventy pounds *per* bushel: indeed he allows nine gallons to a bushel.

It seems to be very desirable, that all grain should, *in the first instance at least*, be sold in open market, agreeable to the proposal of J. L. Vol. IV. page 199. For badgers now buying corn at the farmers houses, give them less profit, under the pretext of carriage, which they take all or in part on themselves, and for which they secure to themselves an extravagant allowance; and besides this, they hereby become masters of the market, and can fix the price: hence the farmer has less gain, and the consumer must pay more, as the grain passes through more hands.

Should this measure be pursued, with proviso that a farmer might sell his corn by a sample, not less than a sack, or any certain quantity, without being bound to bring *all his granary* to the market, or with any other restrictions which may appear necessary, it would probably be an act of great utility. Be that as it may; it is certainly expedient that a standard of weight should be fixed, which shall be deemed equal to the legal bushel; and that the
uniform

uniform observance of such bushel, by weight or measure, should be strongly enforced.

The necessity of such a regulation arises both from the present uncertainty of weights and measures, and also more especially from the advantage dealers in corn take of the ignorance of the farmer, with respect to the *mean* weight of their grain, by which the sale should be guided, and not by the weight of extraordinary crops.

You, gentlemen, would therefore do a public service if you could prevail on E. S. of Middlesex, J. L. of Buckinghamshire, Warwicensis, (who has already favoured you with the weight of wheat) or any other of your friends or correspondents, to endeavour to ascertain the exact mean weight of oats, barley, and rye, as well as of wheat, which last seems (as I have more than once said) to have been well ascertained in the Sixty-first Number of your Second Volume; though I doubt not the author of that paper would be as well pleased as the public must to see his calculations confirmed by others.

Would my present situation admit of it, I would myself give an helping hand.

As fresh crops will soon give an opportunity* of making proper trials, and forming calculations, I am in hopes you will not think this letter totally unseasonable.

I am, GENTLEMEN,

Your constant reader,

Aug. 10, 1765.

Z.

P. S. In the Third Volume of Mills's Husbandry, pages 368—373. is a description of Du Hamel's *three-coultered plough*, and its defects (which have been experienced to be such as he suspected): if any of your mechanical readers could reform it, so as to lessen the inconveniencies of its construction, he would do a service to agriculture and the public. I doubt not, you, gentlemen, would readily give a plate of it so corrected.

VOL. V. No. 24.

X

I refer

I refer to Mr. Mills, who has pointed out what seemed wanting to render this plough more complete, and has proposed certain additions, of which I am not a sufficient mechanic to judge how far they would answer. The plough itself not being very complex, I doubt not your mechanical readers will easily render it complete, or will be able to judge whether the additions and alterations to it proposed by Mr. Mills, (with great modesty) would be likely to answer the ends desired.

Since the above *P. S.* was written, I recollect that you have recommended the three-coultered plough, page 191. of your Fourth Volume. As it has, justly, your approbation, and Du Hamel, and even Mr. Mills's Husbandry, is in fewer hands than your publication circulates, it would be, I think, a public service if you would give a plate of it, with such additions, and such reflections on the use of it, as you think proper, unless you rather chuse to refer to Du Hamel or to Mr. Mills for its use *.

NUMBER XXXI.

On the Winter-Management of Meadows and Grass-Grounds.

GENTLEMEN,

IT gives me (and I make no doubt every other lover of agriculture and useful knowledge) infinite pleasure to find your undertaking carried on with so much spirit and public utility, notwithstanding what some may say to the contrary, who, perhaps, might secretly rejoice to have it fall to the ground: and how any person can with such a thing, who is endowed with the least share of reason or public spirit, is amazing; for certain it is, (let the envious or ill-natured say what they will) the *Museum Rusticum* is

* If any of our ingenious readers will send us a model or drawing of the three-coultered plough, wherein the defects above noted are remedied, we will cause an engraving to be made from it with great readiness. E. O.

is the most useful undertaking that has been published for this century past.

The world must allow it has been the means of a new light being thrown on husbandry, both to the advantage of the honest countryman who is willing to be instructed, and the beauty of that country where such instruction is put in execution.

By what I now say, gentlemen, and have said, in praise of your *Museum Rusticum*, some may accuse me of self-interest and flattery; the first of which I really have not in view, any farther than the pleasure and instruction I gain in reading so useful a work; and as to the latter, I surely can have no view in flattering a set of gentlemen I have not the least personal knowledge of*.

But what must we say, gentlemen, to those publishers of news-papers, who daily steal from your collection what letters they please, and have the effrontery to republish them in their papers, with these words at the head of them, TO THE PRINTER, as if they were originally sent to them? Indeed such proceedings cannot impose on the purchasers of your work, but they certainly must on those into whose hands the *Museum* may not fall. It is much to be lamented those smuggling gentry cannot find matter enough to fill up their papers without pilfering in so notorious a manner, and giving us that for news which is as much known, and perhaps in as many hands, as are their collections of thefts.

I am sorry, gentlemen, I must dissent from the Rev. Mr. Comber. I mean not, however, to dispute, but to convict: I am open to conviction myself, and should be glad any friend would set me right, when speculation, or my own opinion, misleads me. In his criticisms and censures (which he is, perhaps, too lavish of) on Mr. Mills's System of Husbandry, *Museum Rusticum*, Vol. IV. page 299. he wonders Mr. Mills should advise the hus-

X 2

bandman

* We are indeed greatly obliged to this gentleman for the compliments he pays us, and in return will do our utmost that this work, which is so evidently useful, shall be carried on with spirit; at least, nothing on our parts shall be wanting. E R.

bandman to cut off the grafs which is not eaten in autumn, rather than to let it rot on the ground: what Mr. Comber has faid to prove this a ftrange practice, appears to be mere theory and fpeculation, without the leaft fpark of practical knowledge, fave in his own neighbourhood; for I do affure you, gentlemen, in this part of the country, and the adjacent parts of Lincolnfhire, both remarkable for many and great graziers, they look upon that man as a very great floven, or one ignorant of his bufinefs, who lets any winter-grafs be upon his grafs-lands in fpring, efpecially tufts or tuflocks of old grafs, fuch as Mr. Comber mentions; to prevent which, they turn in poor cattle of all forts, who muft eat fuch or ftarve, to clear the grounds of fuch ftuff by fpring. If Mr. Comber had turned in fome horfes, oxen, or fheep, in tolerable good condition, to a ground over-run in fuch a manner, he would find they would not touch one of thefe tufts, until they were pinched with hunger indeed, though there was ever fo much young grafs amongft them; for truly they ftink, or are too rank; for which reason, as I faid before, we always turn in lean ftore, who muft eat them or nothing; and when the ftock will not, we take the fcythe to them; for we always think it much the neateft and beft to have our grafs-lands look level in fpring, and free from any of thofe tufts of luxuriant grafs, well knowing there is no ftock will eat them, but when they cannot help it. As to what Mr. Comber fays in refpect to the growth and vegetation of young grafs amongft the old, I fhall fay nothing of it, thinking it no ways effential or conducive to the more neat and advantageous management of grafs-lands. Such a theory may amufe, but never can inftruct the practical farmer or grazier; and he who can be better employed, fays an old philofopher, is idle, if he beftows his time on worfe. I am, GENTLEMEN,

Your ufual well-wifher, &c.

Ille of Ely,
August 17, 1765,

G. B.

P. S.

P. S. In some future letter I shall give you a full account how we feed beasts (I mean bullocks or cows, and when I say feed, I mean fatten) with linseed cakes, and likewise an account of a better, cheaper, and quicker feed than cakes in England, but not in Ireland, as linseed cakes there are cheap indeed*.

NUMBER XXXII.

An Account of some Burnet sown on a poor sandy Soil.

GENTLEMEN,

I Am possessed of some land in this county of Lincoln, which was a few years ago not worth above two shillings an acre. It is of a light sandy nature, is not fit for the plough, and the grafs has seldom been worth mowing.

As this was the case, you may imagine, gentlemen, I was desirous of improving it: accordingly I got ten acres of it ploughed and in good order, and sowed it with faintfoin the year before last, allowing with it one bushel of barley to an acre. The barley paid me for my expences of tillage; and I had last year of faintfoin a load and an half an acre, besides the after-feed; and this year the crop is rather better. Saintfoin hay I reckon here worth thirty shillings a load; so that my land, from not being worth above two shillings an acre, now yields me a return of forty-five shillings, bating only the expences of mowing and making the hay, which are but a trifle.

The same year I was willing to try the burnet, of which I had heard so much said: accordingly in August I caused five acres of the same kind of land to be sown with it. The land was well prepared, and I allowed for each acre twelve pounds of seed, which I bought of Rocque of Walham-Green.

It

* A letter on the above subject will be highly acceptable to us, as it will give great satisfaction to many of our readers, not only in England, but in Ireland, and the American Colonies. E. R.

It did not indeed answer my expectation ; for last year it run all to stalks, there being very few leaves on the plants, so that I had not above seven hundred weight of hay from each acre, and that very bad. This year the crop was still worse, perhaps owing to the long drought : however, I am so dissatisfied with it, and find saintfoin so much superior to it on my land, that I have ordered the five acres to be ploughed up ; and next spring I intend to lay them down in saintfoin.

Burnet may do very well on Mr. Rocque's high manured land near the metropolis, and perhaps on some other land that is very good in nature ; but on poor sands I think I may venture to say it will never yield any thing of a crop.

I have also on this land tried lucerne ; but it was more for curiosity sake than with any expectation that it would succeed, as I partly knew that it would only thrive on rich land : and indeed so it proved, for it came up very sickly ; and though I took all possible care to keep it clear of weeds, yet did not the plants thrive even so well as I expected. This year (for I sowed the seed broad-cast) I harrowed the land according to Mr. Rocque's directions ; but the plants had, by some means or other, taken such little root in the land, that the drags pulled great part of them up, as well as the weeds, and what remained were most of them killed by the dryness of the season. I sowed, it is true, but two acres ; and these I shall next month plough out.

A neighbour of mine, a man of fortune and distinction, has also tried the burnet on such poor land as I have above described ; and he has rather worse success than I had. Saintfoin yields him large returns, and he makes annually a great deal of hay of it.

I would not, gentlemen, by any means wish to discourage your readers from making experiments in agriculture : I am fond of them myself, and really they are of very great service ; yet I am firmly of opinion, that experiments which do not succeed, ought to be made known, as well as those that do, as it will save much trouble and expence to your practical readers.

Some of your correspondents have, I think, told you, that burnet will thrive on the poorest sand: I should be glad to know if those gentlemen have actually experienced it, or if they only relate it on the report of others: and I cannot but think that even Rocque himself is deceived when he thinks in this manner; but time, which brings all things to light, will soon ascertain the good qualities of this much-admired burnet. I would, however, advise your practical readers not to make their experiments too extensive at first: let them sow a rood, or half an acre: if that quantity succeeds on their land, they may venture afterwards to sow as much as they please, without running the risk that I did, and suffering a considerable loss for want of knowing that burnet will not succeed on a poor sand.

I am, GENTLEMEN,

Your constant reader and admirer,

Lincolnshire,

A GENTLEMAN FARMER.

August 2, 1765.

NUMBER XXXIII.

On the Qualities of Sea-Salt, with Respect to Vegetation.

GENTLEMEN,

BEING a great lover, as well as a practiser of agriculture, it naturally occupies a considerable part of my thoughts.

My health being on the decline, I have been, for some weeks past, at Margate, imagining that bathing in the sea might be of service to me. As I cannot be idle any where, I have made frequent excursions to various quarters of the isle of Thanet, in order to make observations on the state of agriculture in this part of England.

I had indeed often heard of the neatness of the Kentish farmers; but, believe me, gentlemen, the method of farming in this part of the county is peculiarly admirable. Their fields are like gardens; they are fond of hoeing-
crops

crops, such as beans and peas; and they spare no expence to keep them clean from weeds.

Their soil is for the most part light; yet have they very good crops of beans, and their wheat is very fine, though it is sometimes subject to be root-fallen; yet they generally prevent this by rolling, or by driving a flock of sheep over the land, which fixes the earth to the roots of the plants, and makes them stand bold and firm till harvest.

The Thanet farmers use much sea-weed by way of manure, which greatly improves their lands, and enlarges their crops. Now, all sea-weeds are known to contain a large quantity of sea-salt, which, according to the experiments made by Dr. Home, is rather prejudicial than otherwise to plants.

I must beg of some of your practical and intelligent readers to resolve for me this difficulty. Why should sea-weeds be of such considerable service to light land; yet to light land, for such it was on which the doctor made his experiments, sea-salt is prejudicial? Is it that the salt in the weed has a mixture of oleagenous particles, or does the putrefaction of the plant so far dissolve or alter the nature of the salt as to make it, in its new form, a proper food for vegetables?

You will, I hope, gentlemen, excuse my giving you this trouble, and believe me to be,

Your most obedient servant,

And an admirer of your work,

Margate,
August 5, 1765.

T. CLARKE.



Museum Rusticum, &c.

For SEPTEMBER, 1765.

VOLUME the FIFTH.

NUMBER XXXIV.

*On the separate Culture of Grasses, and the Improvement of
Grass-Grounds.*

GENTLEMEN,

IT gives me a most sincere pleasure to perceive that the attention of mankind is of late so much awakened to the culture of grasses, and the improvement of grass-grounds.

No part of husbandry seems to have been more neglected by our ancestors than that of laying down their grounds to meadows. I have been told it was the common custom in former days to sow no seeds of any kind with the last crop of corn: they committed to nature the stubble-field, and left it to cover itself with such grasses or weeds as the winds brought. Of course, a great number of years must have passed before they could cut a crop of any thing that deserved the name of hay; for though Nature is very bountiful in this island, and never

VOL. V. No. 25.

Y

fails,

fails, in process of time, to stock our good lands with such grasses as will conquer a great many of the weeds, and keep possession, yet her progress is very slow when not aided by the hand of Art.

The introduction of white clover-seed from Holland and Flanders (though a reproach to us to bring it from thence, as it is one of our most common native plants) has been of singular service to the improvement of our meadows; for the practice of late years has been to sow a proportion of this, and of yellow clover, called nonsuch, together with some rye-grass or hay seeds, gathered from the sweepings of a hay-loft, along with the last crop of corn.

By this means the farmer is secure of cutting a large crop of middling hay the next year after his barley or oats. I say of *middling hay*, because I do not think either rye-grass, or any hay-seeds that we can purchase, will afford such excellent hay as that of old meadows, or such as, with a very little pains, we might, in a few years, be sure of having by collecting proper seeds.

Rye-grass is too much esteemed by some, too much condemned by others.

To speak the truth, it is, I believe, neither one of the best or worst of our English grasses; but till such time as we can purchase the seeds of some of the preferable sorts, as clean as we now can get that of rye-grass, I shall be inclined to think that he who sows it, acts more wisely than the farmer who trusts to the chance medley of his own or his neighbours hay-loft; for, if the hay of the loft, from whence the seeds come, was good, it must have been cut before the seeds of the best grasses were ripe, probably whilst they were only in flower, though those of the weeds, which grew in the same mead, may at that time have been in perfect maturity.

Some gentlemen, who write upon husbandry, have recommended to let the hay on a good meadow stand till the seeds are quite ripe, and then thresh them out for use. I agree with them that they will thus have a much better chance

chance of obtaining good seeds than from a hay-loft; but still I fear they will not get what they want; for, besides the difficulty of avoiding the weeds, (too commonly found even in good meadows) as I just now mentioned, such as crow-foot, dandelion, &c. there is another, which seems to be insuperable.

In all old meadows we find six, seven, eight, nay, sometimes nine or ten different grasses. These ripen their seeds at very different times of the year; and, what is still worse, those amongst the number, which are supposed to be the best both for pasture and hay, ripen at distant periods from each other, some in the beginning of the spring, and others not till after Midsummer.

The dwarf-poa (commonly esteemed the best for butter) and the vernal (which is supposed to improve the flavour of hay) are both ripe, and have shed their seeds, even before the time they commonly cut their hay in some places. The great poa, yellow oat, and meadow fox-tail, ripen in June; the timothy and meadow-fescue, not till the end of July.

From hence we see the impossibility of coming at all the grasses we wish to have by any other means than that so strongly recommended by the society, of gathering them first by hand, and then cultivating them separately in drills distant enough to admit a hoe.

A small stock, once gathered thus, may be soon multiplied so as to supply the whole kingdom with sufficient quantities of seed.

We may also observe, from what is mentioned above, that there would be an impropriety in sowing all the different kinds, supposing we even had them, on the same field, if it was ever intended to be cut for hay; for every body allows that hay is best when cut in full bloom, and loses much of its quality when the seeds are shed from it. Some may object that the best hay is produced from a mixture of many grasses: if so, you may sow on different fields the different kinds, classing them together according as they ripen, and afterwards mix all together in the stack,

as they do apples in the cyder-press, or cyder after the juice is expressed. You will, by this means, gain the further advantage of having two or three months to cut and make your hay, instead of being confined to about as many weeks, which is the case at present.

Others may alledge, that all the different grasses are necessary to form a good pasture for cattle; and that it is natural to suppose so, since Providence has sent them.

However natural the supposition may be, it is uncontestedly true, that there are two or three of our English grasses which no animal, we introduce to our fields, will eat when green*.

Though I have mentioned the names of several of the English grasses, and the supposed qualities of some of them, yet I do not pretend, from my own knowledge, to say which is the best for any particular use. I have, it is true, formed some conjectures; but these are not as yet sufficiently well grounded to enable me to assert any thing: it might possibly mislead others, at a time when I only mean to induce them to go hand in hand with me in making experiments and observations on a branch of agriculture, which I believe very worthy of attention.

The few experiments I have made myself, justify me, however, in supposing that a great difference will be found in their different qualities, when trials have been made and repeated.

We are as yet in the infancy of our knowledge on this head, and it gives me pleasure to find we have even got to that state; for the interval is not long, in this country, betwixt infancy and manhood in matters of real utility. It does not seem very unreasonable to expect that we should in a few years discover, by sowing all the grasses separately, which is the one that will yield the greatest bulk of good hay, which will best endure the frequent repetition of the scythe, which loves a strong, and which a light foil,

* We could wish our correspondent had particularized these grasses. E.

foil, and, above all, which is best adapted to fatten each of our different kinds of cattle.

That animals do distinguish betwixt one kind and another, is evident on a very slight observation. In a field abounding with rye-grass, cock's-foot, and crested dog's-tail, if you first turn in horses and cows, they will eat down the rye-grass and cock's-foot, leaving so much of the crested dog's-tail untouched, that the field will seem to be covered with its bents; but if, on the contrary, you had first turned in your flock of sheep, they would have eat down the dog's-tail very near the ground; they would next have attacked the rye-grass, and ate it tolerably bare; but the cock's-foot would have got leave to shoot up its bents.

Though these three grasses grow in most of our meadows, yet I suspect none of them will be found to deserve being placed in the first rank. The dog's-tail seems rather calculated for sheep-walks on poor soils (as it will thrive on them) than for good rich ground; for it always remains a diminutive plant, and no cattle but sheep seem fond of it. The cock's-foot is a coarse hard grass, which cows and horses eat after they have fed down some of the sweeter kinds. Rye-grass does not branch out sufficiently from the bottom, and it roots so near the surface, that it soon exhausts the soil it grows in, consequently requires a great expence in manure to keep the ground in heart. It has another defect, which renders it very unfit for any field in view of a gentleman's house; for so early as the month of May, the verdure which it preserves, in common with some other grasses, during the months of March and April, is converted to a dark purple, which lasts till the hay is cut; and the bents which grow up afterwards in the summer months, give a meadow the appearance of a stubble-field.

Having mentioned these faults, it is but just to acknowledge that I have always found it make a most wholesome good hay, if cut just before it begins to bloom. Besides this, all cattle eat it, and seem to like it tolerably well, both when growing, and when made into hay.

I have

I have some reason, however, to suspect that sheep do not fatten so soon upon it as on other kinds of grafs; but where can we go to find the other sorts of grafs as clean as we do that of rye-grafs, till such time as some one, excited by a public spirit, or by the encouragement given by the society, shall have collected a stock large enough to bring to market?

Lest neither of these should be sufficient motives for any one to undertake the task, I will mention one more, which generally operates pretty powerfully, *self-interest*. Self-interest should induce people to turn their attention to this sort of culture; for he who is possessed of a stock of clean grafs-seeds of the best sorts may command his price.

Wheat, barley, and oats, remain but a year in the ground; yet how attentive are we in the choice of the seed! Do not we buy at an advanced price what seems to be most clear of weeds? How much more attention must we suppose would be given in chusing (if there were a choice) the seed of a plant which, once sown, will continue to eternity!

Some of the slovenly farmers, perhaps, would not give a due encouragement for the pains taken to make the first collection; but the most intelligent ones would: supposing, however, none of the farmers should buy any of it, there are enough of gentlemen who have grounds in their own hands, which they mean to convert to meadow, who are forming lawns they wish to see covered with the greenest sorts of grafs, who are extending their parks, and would be glad to sow in the new part the most proper food for venison; enough, I say, there are of gentlemen to take off, at any price, a very large quantity of such seeds, if they could get them clean.

The only difficulty seems to be the knowing certainly which of the grasses is best adapted for each of these purposes.

As I said before, I have not experience enough myself to assert any thing positively on this head, and that nothing but repeated experiments can ascertain this point beyond

beyond a doubt. But we have the advantage of knowing Mr. Stillingfleet's opinion: this gentleman, who is a very accurate observer, and whose character for veracity is well established, has obliged the world by publishing his observations upon grasses. Nothing seems wanting to give us that confidence in his opinion, which should be next to a certainty, but his never having had an opportunity of cultivating all the grasses separately himself: we ought nevertheless to pay that deference to it which it deserves; and, as his treatise may not be in the hands of all who read the *Museum Rusticum*, I wish you, gentlemen, would collect from it a short view of the purposes each of those grasses, to which he gives a preference, is best adapted. I have not his tracts by me at present, otherwise I would not have given you this trouble, which, I hope, however, you will not grudge, as it will certainly be a very acceptable present to your readers.

The writers on husbandry have differed much in opinion about the most proper methods of laying down grounds to grass: some advise to sow the grass-seeds alone, without any crop of corn; others adhere to the more common way of laying down along with barley or oats: neither do they agree about the season for sowing grass-seeds, spring, midsummer, or autumn.

In one thing only they all concur, that the ground to be laid down should be winter and summer fallowed the preceding year.

In order to satisfy myself, I have tried all the different ways recommended; and, after repeated experiments, it seems to me that both the season and method ought to depend upon the nature of the soil.

In light lands, where no wet stands in winter, I prefer sowing grass-seeds in the middle or end of August, without any crop of corn. The ground at this season is generally very warm, which, assisted by the constant dews every night, and accidental showers, promotes vegetation so much, that the grass gets up immediately, and takes full possession of the land. Besides, I have observed that the
weeds

weeds most noxious to grafs do not vegetate so readily in autumn as in spring; and such as do grow, are frequently killed by the rigour of the ensuing winter. I would not, however, advise any body who sows in autumn to be later than the first or second week of September, lest the first frosts should come before the grafs has established a root able to resist them. Rye-grafs, however, is an exception. This may be sown even in October.

If land is stiff, consequently cold and wet, I think it better to defer laying it down till spring, excepting once more rye-grafs, which will endure all the wet that lies upon the land in winter: but many of the tender grasses, and the white clover, would certainly be killed, if the winter proved cold and wet; in which case it would be necessary to sow the field over again in spring. Were this the only inconvenience that arose from laying down such grounds in autumn, the loss of the seed is such a trifle, that every body would run the risque, in hopes the winter might prove mild: but, alas! it cuts much deeper; for most people, when they sow grafs-seeds, throw down the ridges, and lay the ground smooth. In such a state, if the surface is not matted with grafs, the water lodges on the land, and reduces it to a pap; and as soon as the drying easterly winds of the spring come, it cracks, and grows as hard as a chalk-stone; of course then, any seeds you sow upon it, finding no receptacle in the earth, lie upon the ground to parch in the sun till the birds have eaten them up.

When such an accident happens, the wisest course, I believe, is to plough up the field, and begin again to pulverize, as you did in the preceding fallow year.

By sowing strong lands in the spring this mischief is avoided, as the ground will have time to be sufficiently matted before the ensuing winter, and the roots of the grafs will be strong enough to resist the frosts.

When one sows grafs-seeds in spring, it seems to me adviseable to lay down with a crop of corn for many reasons.

First, because one cannot get a good crop of hay from grafs sown in spring, unless the summer is remarkably wet. Were my future crops, however, to be benefited by the loss of a year's produce, I would chearfully make that sacrifice: but,

Secondly, In my opinion, grafs gets up better under the shade of corn than when fully exposed to the sun, especially in a dry season.

Thirdly, If you have not corn, you are sure to have abundance of weeds, even though your land had been fallowed for two years together; but if the corn gets first possession of the ground, many, if not all the weeds will be excluded.

The spring of the year is the natural season for all weeds to vegetate; and many of them are not prevented from growing vigorously by a drowth, which would effectually hinder the grafs from pushing its head out of the ground. I have twice tried the experiment of sowing grafs-seeds in spring, and do declare, that I never succeeded so well as when I had along with them even a full crop of corn; notwithstanding which I should think it more adviseable to sow no more corn than just enough to keep down the weeds, and shelter the grafs.

A bushel, or a bushel and a half, *per* acre, according to the state of the land, may suffice for that. I also suspect the grafs would thrive better if the barley or oats sown with it were cut green for fodder, just when they push into ear, instead of standing to ripen.

As to the laying down at Midsummer, I never tried it but this year; and the season proving remarkably dry, it has succeeded very ill: I impute, however, part of my ill success to having sown the seeds alone without corn; so I intend to try it again next year, and to sow buck-wheat, or summer tares, along with the grafs.

One of the advocates for laying down to grafs without any crop of corn, is Mr. Miller, a gentleman to whom mankind is greatly indebted for the indefatigable pains he has taken to instruct himself, and communicate to them

many of the most useful lessons that ever were published, either in agriculture or gardening.

It is with great submission I differ from him in any point; but in this I must, for the reasons assigned; and I wish he would, with his usual accuracy, make a few more experiments, with and without corn, in the spring of the year, in order that the truth may be fully ascertained; and I have no doubt that he will, in another edition, candidly confess the error, if it be one.

Every fact relative to the laying down of grounds is very essential in a country like this, where the demand for hay and butcher's meat encreases so much, that thousands of acres are annually converted from arable to grass. The arable, however, does not seem to diminish, but the contrary: I presume therefore a larger quantity of waste ground is ploughed up than supplies the defect of what is turned into meadows.

Any one who travels through this fertile island, and sees how bountifully nature repays our pains, will be astonished to see such large tracts of rich good land still uncultivated, as are to be found in every county of the kingdom, not even excepting the neighbourhood of the metropolis. As the spirit of agriculture encreases, these will diminish, and our population encrease. To encourage this spirit, seems therefore an object worthy even of the legislature itself.

The society in the Strand have been at great pains to point out to mankind several objects which seemed to have lain too long unnoticed; and it is to be hoped, that in a few years more we shall see many advantages accrue from the premiums they have offered, which are very liberal, considering the state of their finances.

To them we already owe the introduction of burnet, which promises fair to become a very useful pasture. We are as yet but little acquainted with it, and therefore ought to suspend all exaggerated encomiums, and undeserved or premature abuse, till we have had time to make repeated experiments, and to discover both its intrinsic and its comparative merit.

We

We are apt, I find, to be too fond of a new plant, as well as of a new medicine. Tar-water, which is really in some few cases a very good medicine, had a most violent, but short, run. Its trumpeters proclaimed, that it not only cured every disease, but also restored youth and vigour. Every body tried it, and almost every body was disappointed; so, because it did not work miracles, it was found to be good for nothing. Such I fear may be the fate of burnet, if we continue to be told from one quarter that it makes the sweetest hay, and that horses prefer it to lucerne; from another, that sheep fatten very fast upon it, and it gives a flavour to the mutton; from a third, that it encreases the quantity of milk a cow gives, and improves the quality of butter: all this may or may not be; but though it should not, I shall nevertheless think it a most valuable plant.

It will grow on poor light soils, where lucerne would pine, and natural grass be ever brown. It will endure the rigour of cold frost, and even vegetate in all open moderate weather during the winter months. It will not, however, as its violent panegyrists say, continue growing in the hardest frosts, nor even in any frost that binds the surface of the ground; for plants of all kinds must remain prisoners, when Nature chuses to lock her door.

We ought to be satisfied that a plant is found which can hold up its head, and look vigorous, in the middle of a severe season, which destroys a great part of the animal and vegetable world. I am not so credulous as to believe that it will make a hearty food for any cattle, if cut when covered with snow: I think myself almost sure of the contrary. It is sufficient to me if it remains ready to receive the first kindly juices of the spring, and is stout and tall whilst other herbs around are but just peeping their heads out of the ground. Whether these other herbs yield a more grateful food, and whether burnet in winter preserves the health, and, of course, encreases the fatness of cattle, remains yet to be proved. I suspect myself there are many other plants which both horses and cows would

prefer in summer; but this we know, that all cattle will eat burnet, nay, more, seem to eat it very keenly; and this being certain, beyond a doubt, I shall ever think hearty thanks are due to the man who bestowed such a present on our country.

Poor old Rocque (whose zeal to second every wish of the society can never be too much commended) is very modest himself on the subject; for though he shews you, *Dat his horse do eat de bornét straw*, he candidly owns at the same time, that his horse has sense enough to prefer lucerne when in his option.

Time will shew us exactly how it ought to be estimated: in the mean while let us not wrangle about its comparative merit with rancour and keenness, like divines in a matter of controversy, or like politicians about the government of a state. Let us rather go on searching after truth, and making new discoveries, with that spirit of patience, benevolence, and good-humour, which naturalists have ever possessed, and which our fields for ever inspire.

Another time, gentlemen, I may perhaps use the freedom to send you my thoughts on other pastures, and the different modes of cultivation thereof*; and am, in the interim, GENTLEMEN,

Your most humble servant,

Clapham, Surry,
August 15, 1765.

PHILO-GRAMEN.

* Philo-Gramen's letters will always meet with a favourable reception; and though he modestly desired us to correct that above inserted, there was very little left for us to do in that way. An elegance of stile is at no time required from our correspondents; and as to the rest, we find great perspicuity, plainness, and strength of reasoning, in this gentleman's piece: we hope therefore he will frequently favour us with his communications; and we have, to oblige him, and at his request, inserted in the next article the extracts from Stillingfleet, relative to the best grasses. E. O. R.

NUMBER XXXV.

Mr. Stillingfleet's Opinion relative to the best English Grasses.

IT is wonderful to see how long mankind has neglected to make a proper advantage of plants of such importance as grasses *, and which in almost every country are the chief food of cattle. The farmer, for want of distinguishing, and selecting grasses for seed, fills his pastures either with weeds, or bad or improper grasses; when, by making a right choice, after some trials he might be sure of the best grass, and in the greatest abundance that his land admits of.

At present, if a farmer wants to lay down his land to grass, what does he do? He either takes his seeds indiscriminately from his own foul hay-rick, or sends to his next neighbour for a supply. By this means, besides a certain mixture of all sorts of rubbish, which must necessarily happen, if he chances to have a large proportion of good seeds, it is not unlikely, but that what he intends for dry land may come from moist, where it grew naturally; and the contrary †.

This

* By grasses are meant all those plants which have a round, jointed, and hollow stem, surrounded at each joint with a single leaf, long, narrow, and pointed, and whose seeds are contained in chaffy husks. It appears by this definition, which is Ray's, that all the kinds of grain, as wheat, oats, barley, &c. are properly grasses; and that the broad, the white, the hop, &c. clovers are not grasses, though so frequently called by that name. STILLINGFLEET.

† I have had several opportunities of observing instances of this slovenly kind of husbandry, and its effects. Instead of covering the ground in one year with a good turf, I have seen it filled with weeds not natural to it, and which never would have sprung up, if they had not been brought there.

Arguments are never wanting in support of ancient customs; and I am no stranger to the arguments, such as they are, which prejudice and indolence have made use of on this occasion.

1. Some say then, that if you manure your ground properly, good grasses will come of themselves. I own they will. But the

This is such a slovenly method of proceeding, as one would think could not possibly prevail universally; yet this is the case as to all grasses, except the darnel-grass, and what is known in some few counties by the name of the Suffolk-grass; and this latter instance is owing, I believe, more to the soil than any care of the husbandman. Now, would the farmer be at the pains of separating, once in his life, half a pint, or a pint, of the different kinds of grass-seeds *, and take care to sow them separately, in a very little time he would have wherewithal to
stock

the question is how long it will be before that happens, and why be at the expence of sowing what you must afterwards try to kill by manuring? which must be the case, as long as people sow all kinds of rubbish under the name of hay-seeds. Again, if the best way is to let the ground take its chance, why is the farmer at the expence of procuring the seeds of the white, and broad clover, which come up in almost all parts of England spontaneously? But if this is allowed not to be the best way in relation to clover of any kind, what reason can be in nature, why grass-seeds only ought not to be sown pure?

2. Others say, that it is better to have a mixture of different seeds. I will suppose this to be true. But cannot a mixture be had, though the seeds be gathered, and separated? and is not a mixture by choice more likely to be proper, than one by chance? especially after a sufficient experience has been had of the particular virtues of each sort, the different kinds of cattle each grass is most adapted to, the different grounds where they will thrive best, &c. all which circumstances are now in general wholly unknown, though of the utmost consequence.

3. It is said by some, that weeds will come up along with the grass. No doubt of it. Can any one imagine that grass seeds should be exempted above from what happens to every other kind of seed? But I will venture to say, that not near the quantity of weeds will spring up which they imagine, if it be sown very thick. Men must be very much put to it, when they make such objections as this last, or indeed any of the others. I am almost inclined to say with a great writer, "It is a simple thing to take much pains to answer simple objections." STILL.

* I have had frequent experience how easy it is to gather the seeds of grasses, having employed children of ten or eleven years old several times, who have gathered many sorts for me without making any mistakes, after I had once shewn them the sorts I wanted.

I have

stock his farm properly, according to the nature of each soil, and might, at the same time, spread these seeds separately over the nation by supplying the seed-shops.

The number of grasses fit for the farmer is, I believe, small; perhaps half a dozen, or half a score, are all he need to cultivate; and how small the trouble would be of such a task, and how great the benefit, must be obvious to every one at first sight. Would not any one be looked on as wild who should sow *wheat, barley, oats, rye, peas, beans, vetches, buck-wheat, turneps*, and weeds of all sorts, together? yet how is it much less absurd to do what is equivalent in relation to grasses? Does it not import the farmer to have good hay and grass in plenty? and will cattle thrive equally on all sorts of food? We know the contrary. Horses will scarcely eat hay that will do well enough for oxen and cows. Sheep are particularly fond of one sort of grass, and fatten upon it faster than on any

I have procured thus the creeping bent, the fine bent, the sheep's-fescue, the crested dog-tail, &c. in sufficient quantities to begin a stock; but for want of a proper opportunity of cultivating them myself, or meeting with any one who had zeal enough to bestow a proper care on them, my collections of this kind hitherto have only proved that the scheme is in itself feasible.

This very year, 1761, a little boy, by my direction, gathered as much of the crested dog-tail in three hours, by the side of a road, as, when shed, yielded, upon weighing, above a quarter of a pound averdupois, perfectly free from husks. As this seed is small, the skillful will easily judge how far such a quantity would go if properly employed.

My very estimable and ingenious friend Mr. Aldworth, who was witness of the fact which I last mentioned, at my desire ordered a small part of a meadow, near his seat at Stanlake, which had better grasses and less mixed than the rest, to be left unmowed till the seeds were fit for gathering. This piece yielded, upon threshing and sifting, a full bushel, by measure, of almost pure seed of the crested dog-tail. In case any one should be inclined to follow this example, I think it highly necessary to observe that care must be taken to mow the grass before it sheds; that it be mowed very early in the morning before the dew is off the ground, and that it ought not to be spread as in making hay, but left as it falls from the scythe a sufficient time, and then gently turned over. STILL.

any other in Sweden, if we may give credit to Linnæus: And may they not do the same in England? How shall we know till we have tried? Nor can we say that what is valuable in Sweden may be inferior to many other grasses in England; since it appears by the *Flora Suecica* that they have all the good ones that we have. But however this may be, I should rather chuse to make experiments than conjectures.

Genus the First.—VERNAL.

(See Vol. IV. Plate II. Fig. 3. of *Museum Rusticum*.)

This grass grows very commonly on dry hills, and likewise on sound rich meadow land. It is one of the earliest grasses we have; and from its being found on such kinds of pastures as sheep are fond of, and from whence excellent mutton comes, it is most likely to be a good grass for sheep pastures. It gives a grateful odour to hay.

ADDITION. This grass I have found on all kinds of grounds, from the most sandy and dry to the most stiff and moist, and even in bogs. It is very plentiful in the best meadows about London, *viz.* towards Hampstead and Hendon. It is very easy to gather, as I have found by experience; as it sheds its seeds upon the least rubbing.

Genus the Sixth.—MEADOW FOX-TAIL.

(See Fig. 9.)

This grass, as well as the foregoing, is found in great plenty in our best meadows about London, and, I believe, makes very good hay. Linnæus says that it is a proper grass to sow on grounds that have been drained.

ADDITION. I am informed that the best hay which comes to London is from the meadows where this grass abounds. I saw this spring a meadow not far from Hampstead, which consisted of this grass chiefly, with some of the vernal-grass, and the corn-brome grass. This grass is scarce in many parts of England, particularly
Herefordshire,

Herefordshire, Berkshire, and Norfolk. It might be gathered at almost any time of the year from hay-ricks, as it does not shed its seeds without rubbing, which is the case of but few grasses.

Genus the Tenth.—FINE BENT.

(See Fig. 10.)

This grass I have always found in great plenty on the best sheep-pastures, as on Malvern-Hills, and on all the high grounds in Herefordshire, that are remarkable for good mutton.

ADDITION. I may add on Bagshot-Heath, and the best sheep-pastures in Berkshire, Oxfordshire, and Norfolk.

Genus the Eleventh.—MEADOW.

(See Fig. 6. and 7.)

These grasses are common in our best meadow-grounds, and, I believe, make good pasture and hay.

ADDITION. I have found them frequently on banks by the road side, and near ditches, even where they were not to be found in the adjoining meadows and pastures.

ANNUAL MEADOW. (See Fig. 8.)

This grass makes the finest of turfs. It grows every where by way-sides, and on rich found commons. It is called in some parts the Suffolk-grass. I have seen whole fields of it in High Suffolk, without any mixture of other grasses; and as some of the best salt butter we have in London comes from that county, it is most likely to be the best grass for the dairy. I have seen a whole park in Suffolk covered with this grass; but whether it affords good venison I cannot tell, having never tasted of any from it. I should rather think not; and that the best pasture for sheep is also the best for deer. However, this wants trial. I remarked on Malvern-Hill something particular in relation to this grass. A walk that was made there for the convenience of the water-drinkers, in less

than a year was covered in many places with it, though I could not find one single plant of it besides in any part of the hill. This was, no doubt, owing to the frequent treading, which above all things makes this grass flourish, and therefore it is evident that rolling must be very serviceable to it.

ADDITION. It has been objected that this grass is not free from bents, by which word is meant the flowering-stems. I answer, that this is most certainly true, and that there is no grass without them. But the flowers and stems do not grow so soon brown as those of other grasses, and being much shorter, they do not cover the radical leaves so much; and therefore this grass affords a more agreeable turf without mowing than any other whatever that I know of.

SHEEP'S FESCUE. (See Fig. 4.)

This is the grass so much esteemed in Sweden for sheep.

Gmelin, Flor. Sibir. says, that the Tartars chuse to fix during the summer in those places where there is the greatest plenty of this grass, because it affords a most wholesome nourishment to all kinds of cattle, but chiefly sheep; and he observes that the sepulchral monuments of the antient Tartars are mostly found in places that abound with this grass; which shews, adds he, that it has long been valued amongst them.

I have among my grasses a specimen of it, but do not remember where I found it. I am certain it is not common in any of the places where I have been. Perhaps upon examination it may be found on places famous for our best mutton, as Banstead-Downs, Church-Stretton in Shropshire, some parts of Wales, &c.

ADDITION. I have since found this grass in great plenty in many parts of England and Wales; indeed on all the finest sheep-pastures in Herefordshire, Berkshire, Oxfordshire, Norfolk, &c. The reason why I thought it not common was, that it is an early grass, and had shed

its seeds before I usually made my searches in those places where it only grows. I must also observe, that, contrary to what Linnæus says, either the sheep, or some other animals, do eat the flowering-stems of this grass; for upon Banstead-Downs there was nothing to be seen but the radical leaves of it, unless amongst the bushes near the hedges, where it was guarded from the sheep.

Genus the Fifteenth.—PURPLE FESCUE.

(See Plate II. Fig. 5.)

ADDITION. This grass I have always found along with the *fine bent* and *silver-hair grass*, particularly on Banstead-Downs in great plenty, in a place enclosed in order to keep the sheep out. From hence I am inclined to think that this is the chief grass all over the downs; but as the flowering-stems in the other parts were entirely gone, unless along the hedges, I could not be certain.

FLOTE FESCUE.

(See Plate I. Fig. 6. of the same Volume.)

I have no knowledge of the qualities of this grass from my own experience, but shall quote something concerning it out of a piece published in the Amœn. Academ. Vol. III. entitled *Plantæ Esculentæ*. The author says there, Article 90, that the seeds of this grass are gathered yearly in Poland, and from thence carried into Germany, and sometimes into Sweden, and sold under the name of manna-seeds. These are much used at the tables of the great, on account of their nourishing quality, and agreeable taste. It is wonderful, adds the author, that amongst us these seeds have hitherto been neglected, since they are so easily collected and cleaned.

ADDITION. Mr. Dean, a very sensible farmer at Ruscomb, Berkshire, assured me that a field always lying under water, of about four acres, that was occupied by his father when he was a boy, was covered with a kind of grass, that maintained five farm-horses in good heart from

April to the end of harvest, without giving them any other kind of food, and that it yielded more than they could eat. He, at my desire, brought me some of the grafs, which proved to be the *flote-fescue*, with a mixture of the *marsh-bent*; whether this last contributes much towards furnishing so good pasture for horses, I cannot say. They both throw out roots at the joints of the stalks, and therefore likely to grow to a great length. In the index of dubious plants at the end of Ray's Synopsis, there is mention made of a grafs under the name of *gramen caninum supinum longissimum*, growing not far from Salisbury, twenty-four feet long. This must, by its length, be a grafs with a creeping stalk; and that there is a grafs in Wiltshire, growing in watery meadows, so valuable, that an acre of it lets from ten to twelve pounds, I have been informed by several persons. These circumstances incline me to think it must be the *flote-fescue*; but whatever grafs it be, it certainly must deserve to be enquired after.

There is a clamminess on the ear of the *flote-fescue* when the seeds are ripe, that tastes like honey, as I have often found; and for this reason perhaps they are called manna-seeds.

Linnæus Flor. Suec. Art. 95. says, that the bran of this grafs will cure horses troubled with bots, if kept from drinking for some hours.

Genus the Seventeenth.—YELLOW OAT.

(See Plate II. Fig. 1.)

This grafs is found in great plenty in some grounds where the *sheep's-fescue*, the *fine bent*, and the *crested dog-tail* grow, and therefore likely to be good for sheep. It is also not uncommon in good meadows.

Genus the Twenty-fourth.—CRESTED DOG-TAIL.

(See Fig. 2. Plate II.)

This grafs, I imagine, is proper for parks. I know one where this abounds, that is famous for excellent venison. It may, perhaps, be as good for sheep.

ADDITION.

ADDITION. That it is good for sheep, I have since found by experience; the best mutton I have tasted, next to that which comes from hills where the purple and sheep's fescue, the fine bent, and the silver-hair grasses abound, having been from sheep fed with it.

It makes a very fine turf upon dry, sandy, or chalky soils, as I have seen in many parts of Berkshire; but unless swept over with the scythe, its flowering-stems will look brown, which is the case of all grasses which are not fed by variety of animals: for that some animals will eat the flowering-stems is evident, by commons, where scarcely any parts of grasses appear but the radical leaves.

N U M B E R XXXVI.

Reflections on the last Section of Dr. Home's Principles of Agriculture and Vegetation.

GENTLEMEN,

HAVING, at a very early age, imbibed a thirst after knowledge, it was natural for me to endeavour to attain those intelligences which were most likely to be of use to me in my after-life.

I was always intended for a farmer; of course I directed my reading and enquiries more immediately towards every thing that had relation to agriculture. I have accordingly read most authors, ancient and modern, who have treated of the subject. I have made every necessary enquiry respecting the modern practices of both English and foreign farmers; and all this was done before I attempted to reduce any part of my knowledge into practice.

May I flatter myself to be in some measure qualified for an occasional correspondent to your work? If you think so, I shall now and then trouble you with my observations.

You may well imagine, gentlemen, that in the course of my reading, Dr. Home's Principles of Agriculture and Vegetation could not escape my attention. I have indeed
read

read it more than once, and shall, perhaps, at a future time, communicate to you for publication some remarks I made on the various parts of that accurate and admirable book; for the present I shall content myself with saying a few words on the plan, for the further improvement of agriculture, contained in the last section.

“Agriculture, says the Doctor, does not take its rise originally from reason, but from fact and experience. It is a branch of natural philosophy, and can only be improved from the knowledge of facts, as they happen in nature. It is by attending to these facts that the other branches of natural philosophy have been so much advanced during these two last ages. Medicine has attained its present perfection only from the history of diseases and cases delivered down. Chemistry is now reduced to a regular system, by the means of experiments made either by chance or design. But where are the experiments in agriculture to answer this purpose? When I look round for such, I can find few or none*. There then lies the impediment in the way of agriculture. Books in that art we are not deficient in; but the book which we want is a book of experiments.

And, indeed, as things stand at present, it must always be so. Mankind are shy in attempting any thing, or at least rendering it public, unless they can make it complete, or erect some plausible system. This they may do in all other arts, but they cannot in agriculture. The time so seldom comes about, and the progress of the experiment is so slow, that one person can make but very few during his life. A number of experiments are to be found, not in the possession of one, but in the hands of many. The fault then lies not in the deficiency of facts; for chance
and

* Since these papers were wrote, I have read three volumes of experiments published by Du Hamel, on Tull's System of Agriculture. They are distinct, exact, conclusive, so far as they have gone, and stand a model for experiments in agriculture. What a shame for Great-Britain, where agriculture is so much cultivated, and where that system took its rise, to leave its exact value to be determined by foreigners! HOME.

and design must have been able to furnish many; but of a certain, proper, and easy channel, through which they might be conveyed to the world, without wounding the natural vanity of mankind."

Truth is self-evident in the above arguments: we feel the weight of the author's reasoning, and cannot help lamenting that a science, on the perfection of which so much depends the happiness of mankind, should be so deficient in all its parts, should be practised almost unassisted by any certain rule, and should meet with so few capable friends who are willing, by a regular course of experiments, so far to improve it as to put it upon an equal footing with the other branches of natural philosophy. This, I say, we cannot but lament; yet must we, at the same time, rejoice, that "a certain, proper, and easy channel, through which experiments may be now conveyed to the knowledge of the world, without wounding the natural vanity of mankind," now exists in your work. I may venture to assert, that the *Museum Rusticum* has already been of more service to the cause of agriculture, than all the publications that were ever made on the subject. But let us return a little to Dr. Home.

This gentleman, who writes for the meridian of Scotland, would have a committee of the Edinburgh society, not exceeding five persons, be named for the branch of agriculture alone, whose duty it should be to receive single and detached experiments, put them in a proper dress, if they stand in need of it, and publish them to the world at stated times, like a public paper. "This manner of appearing," continues he, "seems calculated to raise a spirit of experimental farming over the country."

One would almost imagine the Doctor had been describing your plan in the above paragraph. You, gentlemen, are members of a much more extensively-useful society than that of Edinburgh; you receive, with the greatest candour, detached essays on the subject of agriculture; you bestow on them your kind corrections,
when

when necessary, and publish them to the world at stated periodical times.

“ The narrator (of the above experiments), says the Doctor, should, on his part, deliver the experiment in the plainest and most distinct manner, and separate the facts from his reasonings. Perspicuity and exactness are the chief beauties in experimental writing. The plain fact should be first told, with all its concomitant circumstances; such as the situation of the ground, nature of the soil, previous culture of it, quality of the seed, country where the experiment is made, state of the air at sowing and after, with regard to heat and cold, drought and rain, wind, &c. The reasoning on the experiment should then follow, and should be such as arises naturally from the experiment. Although it is not necessary to mention any name to the public, yet the experiment, when delivered, should be subscribed by the person who made it, to avoid all imposition.

In order to encrease the spirit of experiment-making over the country, I would propose, that this committee should have it in their power to grant one or more honorary or lucrative premiums to those who shall have delivered the most ingenious and useful experiments in agriculture. It is in this way, I think, that the premiums designed for agriculture should be established. They ought to be, not on such subjects as the farmer is naturally led by his own gain to pursue, for such he will generally follow, to the utmost of his knowledge and abilities, but on such as are not so nearly connected with gain, and make him go out of the common road. This confinement may, however, be too great at the first setting out; and it may be more adviseable, to admit all experiments for some time, till the spirit be once raised.

The happy consequences of this scheme are very evident. Farmers will begin to see the only method of cultivating this art with success; they will attend to minute circumstances to which they never did before; they will be fond to communicate the issue of their experiments

ments to the public, when they can do it in that easy and concealed way; they will have a dictionary of facts to consult upon occasion; and will be able to draw advantage from both the good and bad success of others.

In time, this plan may afford fund sufficient for some future comprehensive genius, who, laying the different, and often seemingly-opposite, experiments together, and considering all their concomitant circumstances, may be able to reduce the practice to fixed and permanent rules. This good fortune seldom happens to the first experimenters in any art; for they see things in too narrow a view, and often with too prepossessed a mind. It is reserved for that unbiassed and sound judgment, which can take from every opinion whatever truth it contains; and, from the whole united together, raise one regular, beneficial, and lasting system."

Many of the happy consequences foretold by this able writer are we already witnesses of; many public-spirited premiums and bounties have been given by the London society for promoting useful arts. Our honest farmers read the *Museum Rusticum*; and though this work has been as yet but two years on foot, yet so great an influence has it had on the more reflecting farmers, that we already see a great change in many of them; they converse like reasonable creatures; they are open to conviction; they begin to lay aside their prejudices, and have already, in part, adopted a more improved practice in their farming.

If this is the case, as it truly is, what may we not expect from their sons? who will be brought up without the prejudices and partialities by which their fathers were so long fettered; who will, by reading and conversation, acquire some knowledge of the theory as well as the practice of agriculture; and who, in fine, will, with surprise, look back on the small crops which their predecessors got from their sound land by their faulty methods of management.

I conclude this letter will not be to the taste of all your readers; yet, perhaps, may it have its use: this I know, at

least, that it will serve as a token of the inclination I have to become your correspondent.

I am, GENTLEMEN,
 Essex, Your humble servant,
 August 2, 1765. A YOUNG FARMER.

N U M B E R XXXVII.

On Mr. Rocque's Grasses.

GENTLEMEN,

I Have observed in my former letters, that I am a great lover of improvements in husbandry, and may take upon me to say, that I have spared no pains in this branch of business for near twenty years, having had experience from an hundred acres of fresh Romney-Marsh land, which I broke up, to above two hundred, nay, almost three hundred, of the very poorest clay and the most barren light sand. Some of the last-mentioned clays and sands I have mended to my satisfaction, so as to produce good corn and seeds.

As I intended to lay down many acres of these last lands with durable seeds, I was determined, though very ill-convenient for me, to visit Mr. Rocque, as there were such advantageous descriptions given of his new grasses, to see of what kind and quality they were; and as three of my friends and neighbours, who also love improvements, had an inclination to go with me; and as several letters had passed between Mr. Rocque and me, concerning the timothy-grass, I wrote him word that I should be in London the seventeenth of June last, and intended myself the pleasure of calling on him next day morning to see his improvements, and begged the favour of him, if he should not be at home that day, to acquaint me.

As I received no answer, suppose, perhaps, he might have been at home that day; but as one of my friends, very curious in this way, was absolutely prevented going that week, I wrote a second letter to Mr. Rocque to this effect,

effect, that as I was disappointed in coming as I intended, by not suiting my neighbours, we intended calling on him the next Tuesday morning; but desired, if he had business to call him from home, not to give himself the trouble of staying at home, not doubting but that we should find somebody to shew us his improvements.

On calling at his house, we were much disappointed in not finding him at home, and more so, when we found only a maid-servant and a little boy to give an account and description of his new grasses.

I asked the maid how long Mr. Rocque had been gone from home, and whether he was gone to Battersea? for if he had been gone there, we should have pursued him; for whatever some of your correspondents may say, and Civicus, in your *Museum* for July, page 42. about the cow, there was very little to be seen at Walham-Green; and that if the cow had liked, and not been prevented, might in a quarter of an hour, have devoured all the poa-grass, bird-grass, and orchard-grass, though, I suppose, they are intended to be encreased to a large quantity of feed, and then to be sold, at whatever price he pleases!

The maid said Mr. Rocque had been gone about a quarter of an hour to London, about buying an horse; for that his old one had got so vicious, by eating burnet-straw, that he had several times kicked the boy, and therefore was obliged to sell him.—*Oh rare!*

The maid indeed was very kind, offered to get us a dinner, treat us with punch, or any thing else. I told her we did not come eighty miles for his loaves or fishes, but that we really travelled so many miles to see his grasses. However the maid was very pressing for us to drink something, and much recommended some wine made by her master of grapes that he grew: the vines, as growing, looked indeed exceeding fine; but, believe me, gentlemen, the liquor was not so; and we were of opinion, that the poa-grass, bird-grass, and orchard-grass will prove as indifferent for cattle, as the wine did for our stomachs:

we have all these grasses in our meadows, and cattle prefer other grasses before them.

The *Museum Rusticum* is undoubtedly well intended, and may be of great utility, if real facts only are given. Yet, gentlemen, I must confess I am jealous of this; for on going to see a piece of lucerne sown in broad-cast, across the road from Mr. Rocque, of ——— Richardson's, (I think that was the name) Mr. Rocque's boy, who was kind enough to shew us this piece, differed more than two hours from the maid about the time of Mr. Rocque's being gone from home; and being told at Walham-Green, that it was unlucky in our having fixed a day for seeing Mr. Rocque, for that he was very seldom from home, unless at Battersea; and this not proving the case, for the maid said he was gone to London, makes me believe that Mr. Rocque did not chuse an inspection of his grasses: it appears also to me, gentlemen, very extraordinary, and is almost a convincing proof to me, that my suspicions are just.

See the Middlesex Farmer's letter in your *Museum*, page 38. of this Volume. "The day before yesterday I went, as I have often done before, to see the state of Mr. Rocque's improvements; when, after a little conversation, he requested me to cross the road to see his field of lucerne, which he had lately mowed, &c." Now, as I said before, this is very extraordinary; for this is the very piece of lucerne which we saw the twenty-fifth of June last, of Mr. Richardson's; and Mr. Richardson's servants were then carrying some of it off for his horses, and they gave us the same account as your correspondent; and Mr. Rocque's maid told us her master had no lucerne but at Battersea.

How surprising this is, unless Mr. Richardson should have sold his land to Mr. Rocque between the twenty-fifth of last June and the first of last July, which I imagine will hardly prove the case. As truth only can stand the test, and as the editors must like that should be their standard, I doubt not but you will give this a place

in

in your next publication *, that your readers may not be deceived by pompous descriptions given of new grasses.

I am, GENTLEMEN,

Your most humble servant,

Sept. 4, 1765.

The KENTISHMAN.

N U M B E R XXXVIII.

Some Experiments made by the Old-Fashioned Farmer in the Culture of Burnet, Lucerne, Saintfoin, &c.

GENTLEMEN,

AS I am an old-fashioned fellow, I therefore am not very eager of embracing any new-fashioned ways, especially in husbandry.

My method, when I was young, was to find out the most experienced old farmer I could, who had got a fortune by husbandry, and to learn of him; and now I think it the safest way to practise what I have found by many years experience to answer best.

But as we old-fashioned fellows are, in this enlightened age, oft looked upon as mere old women; therefore, in order to polish myself, to be fit to converse with the new schemers in husbandry, I have made a few trials of some of the most famous new grasses, and do here send you a short

* We have, to oblige this gentleman, who has communicated to us several valuable pieces, inserted this letter, though we think he concludes too rashly against poor Rocque, who has a great inclination to oblige, and who certainly deserves well of this country in general for the attention he has paid, under the patronage of the society, to the improvement of our pastures. He is, we can venture to say, always happy when he happens to be in the way to answer any curious questions gentlemen may put to him; and if he is at all to blame in this matter, it is for not leaving some proper person to give answers in his absence. In all probability, if our correspondent and his friends had taken another ride to Walham-Green the next day, they might have seen him, and would have been well pleased with an hour's conversation with the old husbandman. E. N. T. R. O.

short account of them; peradventure they may be of some use to some folk who read your *Museum Rusticum*.

Last year, when most gentlemen farmers were lucerne and burnet mad, I was induced to sow (in April) about half an acre of lucerne broad-cast, amongst oats, on a good, light, dry soil well dunged.

I also sowed about the same quantity of ground in another place, which was a light, moistish soil, well dunged; and, to have a fair trial, I sowed in a third place near the same quantity, which was a moderately-strong soil, not dunged, but tolerably good: by the side of each I sowed clover and rye-grass amongst my oats, and the success I had was very good with the last, but extremely bad with the lucerne in all the places; yea, it was such poor dwindling stuff, that it is now good for nothing.

But, in order to make a more exact calculation, I sowed in May last year, on a light rich piece of land, one bed of lucerne broad-cast, a good large spot of *ditto* in drills, one bed of Rocque's burnet broad-cast, one bed of clover and rye-grass *ditto*; and by the same spot was sowed, the spring before, a bed of saintfoin. They all grew well, and I kept them very clean, and where the burnet missed, I planted more from where it was too thick.

That year the burnet was most in my favour, till I came to try how my cattle liked it, and found that they preferred all the rest before it. I tasted it myself, and found it much like cucumber peelings; so in the winter I made fallads of it, which I find is the chief use that the French apply it to.

This year, on the seventh of May, I cut a yard square of each, and weighed them.

			lb.	oz.
The lucerne broad-cast weighed	_____		1	8 $\frac{1}{2}$
Lucerne in drills half a yard apart (three rows I cut)	_____	_____	2	1 $\frac{3}{4}$
Saintfoin	_____	_____	2	1
Burnet	_____	_____	4	12 $\frac{1}{2}$
Clover and rye-grass	_____	_____	5	3 $\frac{1}{2}$

The

The lucerne in drills is now fit to cut again; but as it requires so much trouble to hoe and keep it clean, it will not pay charges.

The lucerne broad-cast is such poor stuff, except the out-sides of the bed, that it is worth little or nothing.

Saintfoin is not fit for good land: in a country where hay is scarce, it will answer to sow upon rocky ground.

Rocque's burnet will produce a great burden; but then it is so stalky and stiff, that it is more fit for fire-fuel than hay.

Common clover, with a sprinkling of rye-grass, and a proper quantity of trefoil and Dutch clover mixed, is, in my opinion, the very best grass-seeds that any farmer can lay his land down with, whether it be intended to lie three years or more.

Perhaps I may be deemed presumptuous in attempting to give directions contrary to what Mr. Rocque says; for so partial are some gentlemen farmers, that they are at as much pains to introduce new grass-seeds to starve their cattle, as others are French goods to starve our manufacturers, not considering what a disgrace it is for this nation, which has ever been famous for good husbandry, to submit now to be taught by a foreigner.

But, as I am a plain old-fashioned Englishman, I shall adhere close to the good old methods of husbandry, which my experienced ancestors have taught; yet I am not so great a bigot, but I would learn, even of a French fidler, providing he could give a plain demonstration that he was able to teach me more certain and better ways of husbandry than I now know.

Nevertheless I do not approve of suffering all whimsical fellows to publish the productions of their brains; because, as most schemers are scholars, therefore they are the more apt to deceive us who are not so*; for, although all the new-invented whims concerning husbandry are mostly
absurd

* Mr. Rocque is no scholar.

absurd and ridiculous, yet as they are commonly sent out in the very best dress that a learned writer can bestow, they but too commonly attract our attention, and set us country folks gaping; and if they chance to come recommended to us by his worship, or any other whose judgment we revere, then poor bumpkin is very likely to be taken in; yet not willing to let his neighbour know that he has been choused, acts like those who went to see the shew of a thing like a horse, but yet no horse, whose head was where its tail should be.

I know a gentleman, who, for some years past, has greatly recommended lucerne to me, and has oft shewed me some that he had sowed, and told me how frequently he had cut it, and what great use it was to him. I commonly took notice, that the expence he was at must exceed his profits; and this year, being able to talk to him experimentally, he acknowledges, that it cannot pay any farmer for his trouble.

From the observations that I have made, I apprehend that we need be at no pains to discover new grasses, having already very sufficient to lay down our lands with, without giving bounties; for, if I mistake not, there is more land laid down already than is consistent with the good of the public; therefore, those who encourage depopulating pasturage, deserve something else more than they do a premium.

For, as I ride through Leicestershire, Northamptonshire, Nottinghamshire, Staffordshire, Shropshire, and Cheshire, I can see, that if more encouragement is not given to tillage, the method of enclosing, and adding farm to farm, raising of rents, and tying tenants from ploughing, which the gentlemen of this age have adopted, will undoubtedly keep up every necessary article of life at a high price; for when rents are raised, and tenants are hindered from ploughing, how can corn be cheap? And if corn is dear, most other eatables will be sure to be so.

As the old proverb says, Corn and horn always go together; and experience tells, that when corn is dear,
flesh-

Flesh-meat is seldom cheap: and if flesh-meat is not cheap, cheese and butter will be dear; therefore, although you have more beef, mutton, cheese, and butter, than usual, yet, because corn is dear, the public reaps no advantage, although the landlord and grazing farmer do; and this makes gentlemen so fond of pasture-land, seeing they can stand a chance to raise the rents of it, whilst plough-farms oft fall in their price.

From hence it is manifest, that enclosing such multitudes of corn-fields, as have been done of late years, is hurtful to the public, and more especially so, where the landlords have obliged their tenants to lay down such and such lands. The advocates for enclosing say, that open fields, when enclosed, will produce more corn than when open; and I grant that they would do so, if the occupiers were obliged by act of parliament to keep them in tillage as before: but when the landlord ties the tenant from ploughing, or where the tenant chuses to lay down his land to graze, how is the country to be supplied from such land with corn?

I defy any one to prove that the open fields in general, which have been enclosed within ten years or more, that such turn out more corn now than when open; whereas it is plain, that many thousand acres of tillable land, which used to produce excellent corn, do not now produce one handful.

Again, another false way of arguing is but too frequently made use of, which is, many say, that farmers when they see corn fetches a great price, will then naturally break up their old turf, and sow more than usual.

This, I grant, seems a very plausible supposition: but then, how can those break up their turf who are tied from so doing? Or how dares a tenant do so, if his landlord is fond of seeing pasture-land? And for the sake of a view, some landlords would have all the ground that lies in sight of their house to be one continued lawn of grass.

Besides, although corn has born an high price for a considerable time, yet not one of the advocates for enclosing can prove, that the farmers in general have broke up more pasture-land than usual; whilst, on the contrary, I can prove, that in this county, Northamptonshire, and Leicestershire, where wheat sells from six to seven shillings *per* strike, thousands of acres of good tillable land have been laid down into pasturage within these few years; therefore, as this is the true state of the case, and as horses, cows, and sheep, have of late sold extravagantly dear, it is certainly necessary to prevent tillable farms from being converted into pasturage.

Our wise progenitors thought proper (as I have shewed in a former letter) to do so, when horses only sold high; consequently, if they did right, we then ought to imitate them, and by some such act as they made, prevent the dangerous encrease of depopulating pasturage; otherwise I, who am no conjurer, can see that the common people will stand a fair chance (like the Westhaddon men*) either to be hanged or starved. A horrid thing to think on, and well worth some powerful man's care to prevent!

Alas! if public spirit has not quite fled from this once-happy island, and private interest assumed her seat, we may still hope for the best. We have an instance in this neighbourhood of a truly-noble lord, who, nor his father, ever raised any tenant's rent, nor ever turned one out to add his farm to another; nor has he offered to enclose his open fields, although he might do so, without any body opposing him, the whole parish being his own. This place is a remarkable instance of the great utility of small farms and cottage-houses; for although it abounds with them, yet the poors levies are very moderate.

I am,

Warwickshire, THE OLD-FASHIONED FARMER.
August 14, 1765.

P. S.

* We are unfortunate enough not to be acquainted with the story of the Westhaddon men; and this may, perhaps, be the case with many of our readers. R.

P. S. We have begun our harvest, and the wheat turns out an excellent crop; all other crops in general light. None of my neighbours mow their wheat, although Mr. Comber has lately revived the affair; therefore, as the farmers of this county will not be persuaded by his reasoning, I shall not be at the trouble of confuting him again. His observations also on a former letter of mine are no confutation. If he, or any other gentleman, will give clear answers to any thing that I write, I shall be always ready to support my arguments, or acknowledge the justness of theirs; but my hurry of business will not permit me to take notice of every body.

NUMBER XXXIX.

Mago's Advice relative to the Management of Mr. Scott's Common-Field.

GENTLEMEN,

NOTWITHSTANDING Mr. Scott condescends to ask advice of others, I am inclined to think him very capable of giving it himself; however, he is quite welcome to the best in my power in regard to the common-field which is fallen into his hands.

There can be no doubt but the fallows he proposes to give it must be of great service in the impoverished state he represents it; therefore I approve of his ploughing in the stubble as soon as the corn is off; but I would advise him to take the opportunity of the frost in the winter to give it a dressing with lime, which, in the spring, should be ploughed in; and, as I think there is no need of his quite losing the summer, I would recommend his sowing a crop of peas or beans at four feet, or four feet and a half apart in the rows. I prefer beans, as they stand erect, and more easily admit the ploughing of the intermediate spaces or alleys: this will be very nearly as good as the summer fallow he proposes, and most likely pay him well. After

the beans are off, plough the land again; let it lie rough during the winter; give it a moderate dressing with lime at the spring ploughing; and then the field will be in excellent order for sowing, as he pleases, with barley or oats, and grafs-seeds; and if the grafs should fail, he may follow my method of turning down the stubble, and give it an autumnal sowing with grafs-seeds.

Nothing answers so well for draining wet lands as stone drains. Y's letter on the subject is very complete. I have long made them: my method is, to dig the depth necessary for carrying off the water, to lay the stones about nine inches square, to cover them with fern, rushes, or a sod wrong-side up, and then fill up the drain with the earth which was dug out; for there is no need of filling the drain up with stones, and indeed the doing so causes the loss of so much land.

I do not wonder Mr. Scott is surprized at the pains taken to reduce the price of butter, when he lives in a part of the kingdom in which butter is sold by the pound of twenty-three ounces under five-pence *per* pound. However, I think his surprise will cease when I tell him, that in and about London, a pound of butter of his weight would cost from twelve to fourteen-pence *per* pound.

When I first read the account of Mons. Lullin's three-coultered plough in Mills's Third Volume, page 368. I was highly pleased with the *thought*; for I could not by any means agree that the instrument he had constructed (see the place, Vol. III. page 397.) would answer the end proposed; and therefore I sent for my wheel-wright, and made one in the following manner.

Take a plank of elm twenty-four inches wide, sixteen inches broad, and four inches thick; in the back part fix two handles, like those to a plough; in the back part also insert the beams: cut two holes in the fore part of the plank, eight inches apart; about three inches behind them; cut three more holes between the two first: by this means you will have five coulter that cut the grafs
four

four inches apart : and, to make it go steady, I fixed two wheels behind, of eleven inches diameter, which raise the plough or plank about five inches from the ground ; and in order to ascertain the depth to which I would have the coulter cut, I put a foot in the beam : I likewise invert the cops, (*bridle or ram-head*) so that by shifting in the notches, I can make the horses press down the fore part of the plough more or less, as I find necessary.

The whole being thus finished, I was very desirous of seeing how it would perform ; accordingly, having about eighty loads of dung that was become very fine by frequent turning, I ordered it to be carried on a four-acre field of grass, and as soon as it was spread, I ordered two horses to be put to my five-coultered plough, intending, as soon as the field was cut over, to bush-harrow the dung into the cavities made by the coulters, having no doubt but it would be of vast service to the grass : however, I shall tell you the truth, mortifying as that truth is ; for the five-coultered plough would by no means answer with me, not however from any defect in the instrument itself, but from the nature of my land in general, which is extremely stoney and gravelly, so that the plough could not pass on, or, if it did, it forced up the stones and turf.

Your having recommended this plough to Mr. Scott, has induced me to give you this account, to inform him and you of my miscarriage, and the cause of it ; for from the nature of his land, I fear he will meet with the same fate.

However, I honour Monsieur Lullin greatly for the thought, and have no doubt but it will be of prodigious service to grass-ground, if the soil is clay, loam, or mould free from stones.

I wish Y. of Bradfield would try a plough of this sort ; I think he would find great benefit from it.

Having mentioned this gentleman, I cannot help saying he is certainly a man of abilities as a husbandman ; but I am sorry to see his manner of taking notice of the *compliment*

pliment I made him, page 231. Vol. IV. by expressing my concern, that I should differ in opinion with a gentleman of his abilities, in regard to Mr. Mills's having made the substance of Du Hamel part of his System of Husbandry.

Y. in his letter, page 286. says, if I read the passage again, I shall find he does not disapprove of his inserting Du Hamel, *otherwise than as, &c.* If this is not complaining, and assigning the reason of his complaint, I am ignorant of my mother-tongue. But, unfortunately for him, he not only did complain, but desired you would publish his complaint; and his saying he paid one pound fourteen shillings for four volumes of Mills's work, is equivocal.

I am really surprized at his violent attack on me for the little matter I said in regard to the *Essays*: your correspondent Eboracensis had said a great deal more; and it was plain I spoke from what he said. It never entered into my head to write a criticism upon them. "I thought all that need be said further on the subject of transplanted lucerne, might be comprised in a letter to the editors of the *Museum Rusticum*." I think so still; nay, more, I flatter myself, I have proved it by my letter, page 307. Vol. IV. but this I rather leave to the opinion of your readers than desire to judge of myself.

Y. is much too warm; and he does right in desiring pardon for this warmth. When he has learnt to cultivate lucerne, I will allow him to judge of the subject; till then, he must allow me to smile at *his* criticisms. However, I wish him success with his madder: and though I thought the letter I sent you for this, gentlemen, too trifling for public view, yet, I hope, it will be of service to him; at least it will shew, that while he was spending his time in unjustly reflecting on me, I was taking no small pains to serve him, and *sponte oblatum est dupliciter gratum*.

To conclude, I hope every one who writes to you, does it with a view to the public good; I declare it to be my sole motive: squabbling among ourselves about trifles can never advance the cause, and I am determined that I
will

will not hereafter be drawn into it: they are unbecoming excrescences, which I hope you, as editors, will in future discard from every letter sent you. Let nothing appear in the *Museum Rusticum* but what tends to public utility*.

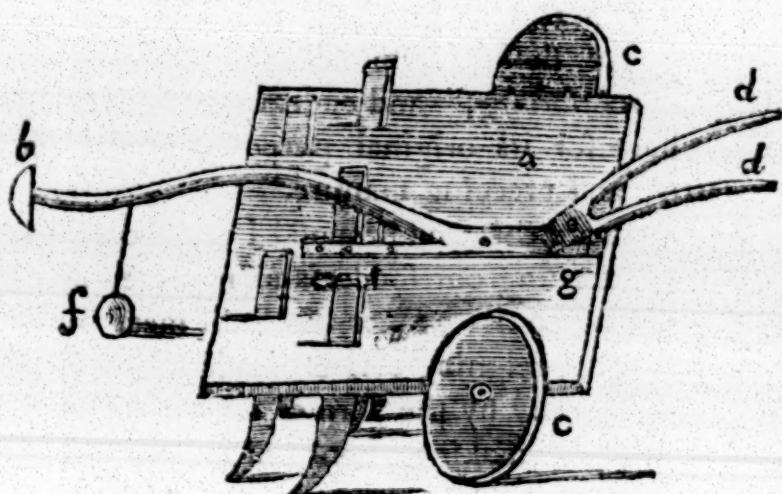
I am, GENTLEMEN,

Your most humble servant,

July 20, 1765.

MAGO.

A Five-Coultered PLOUGH.



EXPLANATION of the above Cut.

- a*, is the plank.
- b*, the beam, with the bridle or caps fixed perpendicularly.
- c*, wheels of solid wood, which move on an iron axle-tree fixed underneath.
- d*, the handles.
- e*, the five coulter, which being made square in the handle, or upper part, fix into square holes, so that they need no wedging.
- f*, is the foot.
- g*, the manner in which the beam is fixed on the plank, and pinned down to make it stronger; the handles being fixed on each side of the beam.

* This letter having been, as the writer informs us, by accident mislaid for some time, we received it not till the first week in September. E.

NUMBER XL.

*A Proposal for encreasing the Quantity of Fodder and Manure
by Suppression of a reigning Evil.*

GENTLEMEN,

AS many rational methods of encreasing our fodder, and consequently manure, by sowing various kinds of grasses, vetches, &c. are daily practised and recommended, so we should remember the wise proverb, "*Saving is good learning*," and endeavour to preserve the fodder we have for its original purpose, "*Maintaining our cattle, and breeding manure.*"

I am well aware that the proposal I am about to make for actually encreasing our fodder and manure, by applying what we have to its proper use, will meet with great opposition; as the reigning evil I would suppress is considered very generally by the farmer as no abuse, but a much wiser way of making money of his crop than by using it as fodder.

Fully convinced, however, that the practice I would suppress is really a *reigning evil*, very pernicious both to landlord and tenant in general *ultimately*, I am resolved, to the utmost of my power, to combat it.

It may require pains to convince men of their true interests, but it is laudable to exert these where the interest is considerable; and as one of the great errors in men's reasonings is to conclude *universally* from *generals*, I shall make allowances for *particular* cases in which this *general* evil must be admitted, to avoid a worse.

I shall, without further preamble, inform you, that the evil I would suppress is, employing almost all our straw of hard corn, especially of rye, (the principal species in this country) in thatching of houses. How much fodder for oxen, and other dry cattle, is hereby lost, and consequently how much manure for our lands, must be obvious

obvious to every one. It is scarcely credible to any person, who has not reflected much on the subject, what advantage the farmer would have in the carcases of his oxen, &c. in spring, if he mixed his hard-corn straw with the straw of oats and barley, and used a cutting-box; and especially if to this dry food he added the variation of a food of turneps sometimes. And what advantage he would derive from the manure, is not easily conceived.

The farmer however will tell us, that "he makes a great deal of money of his hard-corn straw when sold for thatching." This I will allow: and it is the sight of this clear money, which seems attended with no expence, that deceives him.

But let him reflect, that from this seeming clear profit, he is first to deduct the expence of delivering out his straw, that is, the labour of his draught and servants.

In the second place, he is to deduct the expence he is at in providing other manure to supply the place of that which would arise from the eatage of his hard-corn straw.

In some places he can procure none; and then his grounds being every year robbed of a part of their natural manure, will give less and less crops, till the farmer will have no straw to sell.

But on supposal that our farmer is most advantageously situated for procuring of other manure, yet the expence of procuring and laying it on his lands, compared with the expence of leading out the manure arising from his straw, will be in general a great deduction from the supposed clear profit made by the sale of his straw.

And, after all this, let him reflect on a truth which the *practical* as well as *theoretical* farmer must have observed, *viz.* that a judicious mixture of manures has the greatest effect. So that, if our farmer rightly valued the manure arising from his hard-corn straw, as it may be mixed with ashes, lime, &c. he would soon find, that he receives with one hand to pay more with the other, when he sells his hard-corn straw.

Let him also reflect how much of his hard-corn straw is consumed in keeping his own houses and out-houses in repair.

The value of this in the manure it creates, and the flesh which it gives to cattle, is totally sunk to him.

There is, however, another evil, little attended to, but of great consequence, which arises chiefly from this abuse of thatching with hard-corn straw. I mean the *feeding*, or rather *putting to feed*, our bullocks too young.

In this part of the world, the evils which result from this practice are well known; yet the *cause* or *remedy* are hardly ever enquired after, nor is the evil itself considered in the extent it should be.

I will therefore consider it particularly, and then its *cause* and *remedy*.

Young oxen put to feed in the best pastures, are well known to feed *very poorly*, if at all. I say *if at all*; for it is notorious that some of them, and even these the best, will, at the end of a summer's feeding, be not fit at all for the butcher; and then the farmer must not only bestow upon them another summer's grass, but, lest he should totally lose their work and grass in the preceding summer, he must keep them up to their present condition by giving them hay, and perhaps corn too, during the winter; or if he wants money, he must sell them so low, as to afford a prospect of advantage to such as will treat them in this manner, or will let them return to their usual winter meat, and begin a-new to feed them in the succeeding summer.

He who puts too young bullocks into a feeding pasture, sees them, if well, *grow indeed*; but he sees them grow in *size*, not in *fat*; insomuch that if they are killed in the end of summer, or even after fogging, the butcher finds little tallow in their insides, and little fat mingled with their flesh; and the tanner will truly tell him, that their hides are thin, and, on weighing, he will find so.

On

On the contrary, if a full-aged ox, which has wrought the fore end of summer, be turned healthy into a good feeding pasture, it is almost incredible how soon he will become fat.

Another evil arising from the putting of bullocks too early to feed, is, the weakening of our draughts, and spoiling of our oxen's growth. The largest oxen now usually seen in our draughts, and which will be put to feed in the succeeding summer, are such as should only begin to work; and two-year *stotts*, (as we call them) whose only work should be to grow and gain strength, are forced to assist the weak oxen so, as to destroy their own little strength, and stop their growth, and bring on diseases.

No judicious person can doubt, but one pair of full-aged oxen, which have been gently used when young, will greatly over-work two pair of the best which are usually seen in our draughts. And here let me add, that the over-working young oxen is a considerable cause why they feed so ill, when put into a feeding pasture, and is another branch of the *same evil*.

I come now to consider its causes: and though others may be assigned, it is clear to me, that the abuse of thatching of houses with hard-corn straw, is the principal. This straw is the properest to be given to oxen advancing to full age, as their stomachs can best digest it; and they will thrive upon it, the winter before they are fed, amazingly. The want of this great help of fodder obliges the farmer to push round his breed at least one year too soon; and the only remedy to me appears to be an application of hard-corn straw to its *natural* and *original* use, the fodder of great cattle. But it will be said, that necessity obliges the farmer thus to pervert his hard-corn straw. I allow this in some particular cases, and in such I can only lament his situation. But I am fully persuaded, that a general reform in the covering of our houses may be brought about *gradually* to the great advantage both of *landlord* and *farmer*. The methods I

would pursue to effect this reform, must be the subject of another letter. In the mean time,

I am, GENTLEMEN,

Your constant reader,

East-Newton,

And cordial friend,

March 19, 1764.

THO. COMBER, jun.

NUMBER XLI.

Of a Reform in covering of Farm-Houses, &c.

GENTLEMEN,

INSTEAD of thatching of farm-houses with straw, I advise them to be covered with slate or tile; and the out-houses to be thatched with *beath* or *ling*.

I am sensible, that the expence of covering with slate or tile will be strongly objected, as will also the general badness of tiles. But I hope these objections are not so strong as to disgrace my proposal, when all things are fairly considered.

Slate is certainly a most unexceptionable cover, where the kind is good; and (except the expence of the wood-work in the roof, which shall be considered below) the main expence of slating arises from the labour of leading the slates from a distance. But it is probable in an high degree, that many slate-quarries might be found, if properly sought for, which are now never sought after, because the custom of thatching with straw prevails, and less wood serves for roofs, and thatch is thought warmer.

But let us suppose, that no tolerable slate can be found at such a distance as to make it prudent to think of slating: yet how improbable is it that clay proper for tiles cannot be found near hand! It is true, that the expence of erecting a *tilery* is considerable; but when once erected and properly managed, it soon pays the erector, and becomes a public benefit to the country around. The badness of tiles is a too general and too just matter of complaint;

plaint; but, as this badness is almost always the effect of an avaricious mismanagement, rather than any inherent bad quality in the clay, the erection of many tileries at reasonable distances from each other, would be a probable means of improvement of the manufactory; for rivalry often obliges people, who were content with such profit as the *monopoly* of a bad commodity brought, to exert themselves when they see they must entirely lose the sale, if they improve not the commodity. Slates are in general an heavy covering; but then they exclude both heat and cold. Tiles are a light covering, but admit both. The former require strong timber, the latter much weaker. By underdrawing of tiles, the inconveniencies they are subject to, may be in a great measure avoided; and, provided that a few slates or tiles, and a little lime, be always in reserve, a house covered well with either may be kept drop-dry with little trouble.

The inconveniencies attending either slates or tiles seem not so great as what attend thatching with straw, as the harbouring of vermin, &c. and though the slightness of the timber necessary for a thatched roof is thought a great advantage on its side in point of expence, yet when the matter is well examined, it will no longer appear so considerable. The main timber in thatched houses must be strong, if they are designed to stand; and in the spars and laths only can any thing considerable be saved. But let us see the consequence. The only effectual method of repairing of thatched houses is, to lay a new coat on the old one. Thus the weight continually encreases; and I have seen houses, in which the thatch has been a yard deep. The consequence is, that the spars and laths, originally slight, unequal to this accumulated weight, bring down all together.

Nor is the difference of expence between *slates*, or *tiles*, and *straw*, so considerable as people are apt to imagine. As the demand for straw for thatching is very great in countries where thatching is the general cover, it is well known that the price of this commodity is lately risen considerably,

would pursue to effect this reform, must be the subject of another letter. In the mean time,

I am, GENTLEMEN,

Your constant reader,

East-Newton,

And cordial friend,

March 19, 1764.

THO. COMBER, jun.

N U M B E R X L I.

Of a Reform in covering of Farm-Houses, &c.

GENTLEMEN,

INSTEAD of thatching of farm-houses with straw, I advise them to be covered with slate or tile; and the out-houses to be thatched with *heath* or *ling*.

I am sensible, that the expence of covering with slate or tile will be strongly objected, as will also the general badness of tiles. But I hope these objections are not so strong as to disgrace my proposal, when all things are fairly considered.

Slate is certainly a most unexceptionable cover, where the kind is good; and (except the expence of the wood-work in the roof, which shall be considered below) the main expence of slating arises from the labour of leading the slates from a distance. But it is probable in an high degree, that many slate-quarries might be found, if properly sought for, which are now never sought after, because the custom of thatching with straw prevails, and less wood serves for roofs, and thatch is thought warmer.

But let us suppose, that no tolerable slate can be found at such a distance as to make it prudent to think of slating: yet how improbable is it that clay proper for tiles cannot be found near hand! It is true, that the expence of erecting a *tilery* is considerable; but when once erected and properly managed, it soon pays the erecter, and becomes a public benefit to the country around. The badness of tiles is a too general and too just matter of complaint;

plaint; but, as this badness is almost always the effect of an avaricious mismanagement, rather than any inherent bad quality in the clay, the erection of many tileries at reasonable distances from each other, would be a probable means of improvement of the manufactory; for rivalry often obliges people, who were content with such profit as the *monopoly* of a bad commodity brought, to exert themselves when they see they must entirely lose the sale, if they improve not the commodity. Slates are in general an heavy covering; but then they exclude both heat and cold. Tiles are a light covering, but admit both. The former require strong timber, the latter much weaker. By underdrawing of tiles, the inconveniencies they are subject to, may be in a great measure avoided; and, provided that a few slates or tiles, and a little lime, be always in reserve, a house covered well with either may be kept drop-dry with little trouble.

The inconveniencies attending either slates or tiles seem not so great as what attend thatching with straw, as the harbouring of vermin, &c. and though the slightness of the timber necessary for a thatched roof is thought a great advantage on its side in point of expence, yet when the matter is well examined, it will no longer appear so considerable. The main timber in thatched houses must be strong, if they are designed to stand; and in the spars and laths only can any thing considerable be saved. But let us see the consequence. The only effectual method of repairing of thatched houses is, to lay a new coat on the old one. Thus the weight continually encreases; and I have seen houses, in which the thatch has been a yard deep. The consequence is, that the spars and laths, originally slight, unequal to this accumulated weight, bring down all together.

Nor is the difference of expence between *slates*, or *tiles*, and *straw*, so considerable as people are apt to imagine. As the demand for straw for thatching is very great in countries where thatching is the general cover, it is well known that the price of this commodity is lately risen considerably,

considerably, and more than is usually perceived, because the size of *logbins*, which should consist of two good sheaves, is now so much diminished, that they usually contain not much above one; and thatchers will commonly work up no more than the usual number in a day; so that he who calculates the expence of a thatched roof according to the old rates, generally finds his payment run far beyond his calculation. Add to this consideration others, *viz.* that the straw of corn ill-got and weather-beat is half decayed before it comes on to the house; that corn ill threshed (as by the carelessness of servants it too often is) sprouts on the house, and decays; that a roof too oblique retains the water, and rots the thatch; that an ill-sowed coat is easily blown off by any wind; that if all these evils are avoided, a woody country gives harbour to various birds, which destroy the thatch in search of flies; that it can hardly be preserved from the farmer's domestic fowls; that it harbours rats, mice, &c. which destroy whatever is in the house; that the water which descends from a thatched house is useless, whereas that from a slated or tiled house is often the best and most useful; and probably a judicious examiner will think that a cover with straw is so far from being the *cheapest*, that it is the *dearest* of all covers.

Now, what I would propose is, First, that landed gentlemen would be at some expence in searching for slate-quarries near their estates.

Secondly, that where no such can be found, they would encourage the erection of tileries, by giving premiums to such as make the *most* and *best* tiles.

That, Thirdly, when they erect any new * houses, they would cover them with slates or tiles, obliging their tenants to give the leading of the slates, or tiles, or lime, as circumstances make it reasonable.

That, Fourthly, they encourage the thatching of out-houses (which it might be too expensive to *slate* or *tile*)
with

* This is already the case about the wolds, and many other places, I hope. COMB.

with *heath* or *ling*, which beds very well when laid on by a good hand, lasts long, and is not subject to many of the inconveniencies attending straw; and is so cheap, that in any country adjoining to the heath-moors, it may be had for the labour of cutting and leading.

I would also advise landlords, who have once been at the expence of covering their tenants houses with slate or tile, in any subsequent lease to debar them from selling any straw for thatch. Though the farmers might at first complain of this restriction, they would soon have reason to bless their landlords for the restraint.

That I may not be thought to recommend what I do not practise, I will inform you, gentlemen, of my own conduct.

In the year 1762, having a farm-house to build from the ground, the length about seventeen yards, and the breadth about five, I sent for a most eminent thatcher to calculate with him the expence of a cover with straw, which I then determined to put on. He told me, with great honesty, that though he liked to work for me, if I employed any thatcher, yet he advised me to cover it with slate or tile. I took his advice upon a fair calculation, though I sent above ten miles for my slates, and gave fourteen and sixteen pence *per* day, nay, eighteen pence, to labourers to get them up; and I think I have no reason to repent, my tenant voluntarily offering to lead me all he could with his own draught, *gratis*. I have this year a large barn to build for the same tenant, and resolve to cover it with tiles, as he will lead them *all gratis*, though from kilns at ten miles distance.

I am, GENTLEMEN,

Your attentive reader,

East-Newton,
March 19, 1764.

And constant friend,
THO. COMBER, jun.

NUMBER XLII.

Of the Cutting-Box, with proposed Improvements.

GENTLEMEN,

THERE seem to be two advantages which attend the use of a cutting-box for horse-meat. The former is, that the worse part of the fodder is hereby much more effectually mixed with the better, than by any other method it could be; and consequently horses cannot, as they are *naturally* inclined, reject the worse.

The latter is, that *maceration* of the meat is hereby greatly forwarded.

The slowness of horses in eating of their meat is a well-known inconvenience on many occasions. They are obliged to *macerate* it sufficiently before it goes into the maw; whereas cattle convey it speedily to their maw, and *macerate* it at leisure, by rumination. And here (by the bye) is observable an advantage of an *oxen*-draught over an *horse*-draught. Oxen are not only sooner ready for work in a morning, by taking in their food more quickly, but at night get their suppers, and then lie down to rest, much more quickly than horses, which, after the hardest day's work, are often obliged to continue on foot a great part of the night to eat their suppers.

Horses also, if in health, are generally greedy feeders; especially if hard wrought; and in consequence of this, have often not patience enough to chew their food. Now, as there is no way to teach them this patience, (as we teach children) and many distempers must arise from *indigestion*, which will follow from a want of due *maceration*, it must be adviseable to give them food as much macerated as we can, without bestowing too much trouble upon it. Who knows not the benefit of giving oats, whose skins are remarkably hard, *broke* in a mill rather than whole, to many kinds of animals? We know that, without this precaution, in many cases they pass whole.

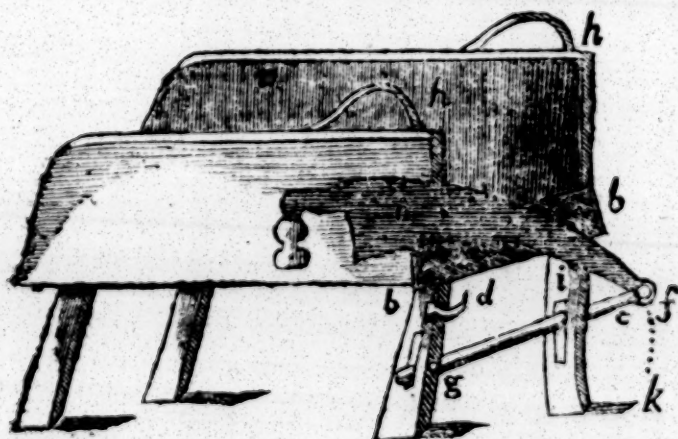
The

The public therefore are much indebted to your candid correspondent from Canterbury, who signs Numb. LXI. by the name of "A Friend to your Work," for communicating his model of a cutting-box, which you have engraved *.

It seems, however, to have happened to this gentleman, as it often does to ingenious men. They are apt to think it an easy matter to conceive what is *familiar* to themselves: hence we find so many representations of easy mechanical operations, which yet are insufficient to instruct those who are strangers to the work; and their authors, ingenious enough, but rather inattentive, wonder at the stupidity of their readers. You know this has happened with respect to your delineations of scythes.

I have met with sensible people who cannot understand this print, and therefore send you, in Fig. I. a delineation of the cutting-box of your correspondent, as it appears when the knife is working, if I am not mistaken, with some further explanation of the parts of it.

FIGURE 1.



The hooks which I have marked *b b*, are, I suppose, handles to move the machine from place to place withal.

VOL. V. No. 25.

E e

I have

* And it is to be wished, that this cutting-box, or one with improvements, were brought into use for hay, at least for *old* or *young* horses; the former often wanting teeth, and the latter by too great use of their jaws weakening their eyes; for which reason (by the bye) they should have no beans, or very hard meat, given them. COME.

I have added what is marked by *g*, to denote the head of a pin of wood, or rather iron, which runs through the foot-post, and on which the lower part of the sweep *f* turns.

I apprehend that the higher end of *f* must have a bend forward, to allow the knife, which is fixed to it, to play parallel to the plate *b b*, and the fore-sides of the fore foot-posts.

But I cannot, with all my attention, comprehend one part of the mechanism of this box. If the sweep *f* go no higher than the head of notch *i*, I see no support for the meat to be cut; consequently the power of the knife over it seems to be in a great measure lost, as the oats, &c. will bend downwards, and in a considerable degree remain uncut*.

There is also, gentlemen, an assertion of your correspondent, which I cannot admit. Whether this dissent proceeds from my forgetting the mechanics, which I studied with great pleasure in *Cambridge*, or from my incomprehension of your correspondent's model, I must leave you and him to judge. I will, however, explain myself with all the clearness and precision in my power.

The centre of motion of the knife *c*, seems plainly to be *e*; the head by which it plays in *f*, the sweep. Now, whatever the motion of this sweep be in the pricked line from *k*, so soon as it comes at *i*, the top of the notch in which it plays, the effect of it seems as entirely lost, with regard to the knife *c*, as though the sweep were actually fixed at *i*; and the power of the knife in cutting seems properly estimated, when considered as connected, by its moveable head *e*, to a block at *f*. All the apparatus then of the sweep *f* seems *useless* and *unnecessary*. But your correspondent has expressly told us, (page 259.) "*f* is the sweep, whereby the cutter has the greater purchase and power." He must therefore explain himself, and set

* I think therefore that the notch *i* should be carried higher in the foot-post, so that *e f* may play in a line with *b b*.
CONT.

Let us right in our apprehensions of his model, by the application of the principles of mechanics, if his box be really constructed on such.

In the mean time he will give me leave, gentlemen, to offer two improvements on his box, which, as he styles himself "*A Friend to your Work*," he will, I presume, be pleased with.

The former of these is, lengthening the handle of the knife *c*; so obvious and well known a method of encreasing the *purchase* or *power* of the *cutter*, and so plainly founded on one of the first principles of mechanics, that it would be an affront, not only to you, but to any of your intelligent readers, and a ridiculous parade of science, to dwell longer upon it. Only I must here observe, that in this, as in all other like cases, the handle is not to be lengthened *arbitrarily*, but consistently with the management of it; and under this restriction the labour will be lessened as the handle is lengthened.

The *latter* improvement I would propose is still much greater than the *former*. It is placing three (or more) knives in an inch frame, as delineated in my Second Figure, in which *e* denotes a lengthened handle, and *d* half an hinge, so formed as to fall in with the other half, marked also *d*, in my Third Figure, in which *e* denotes an iron bar, sufficiently strong, and fastened to the bottom of the cutting-box, parallel therewith.

FIGURE II.

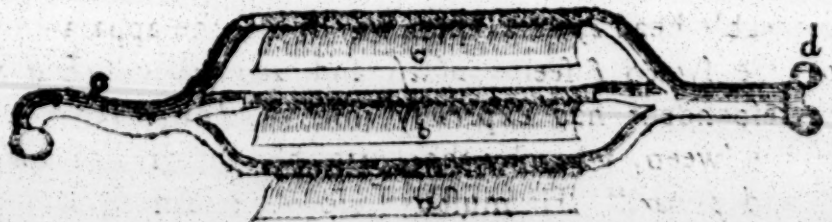
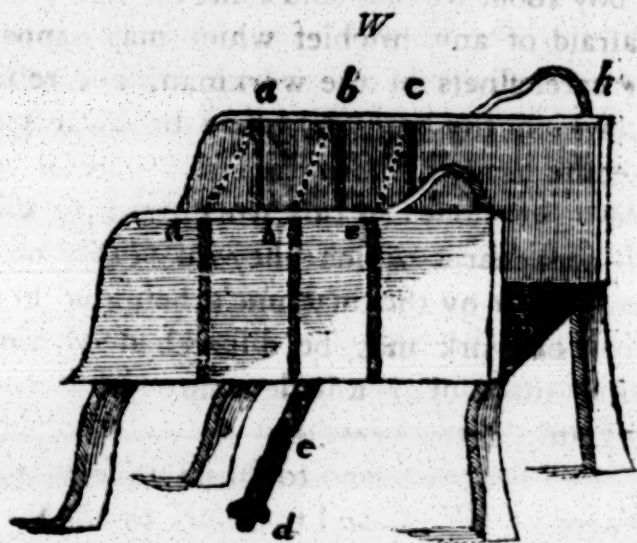


FIGURE III.



The knives *a*, *b*, *c*, in Fig. II. fall into corresponding notches, marked with their respective letters, in Fig. III. the pricked lines denoting the path of the knives edges when they begin to fall upon the meat laid in the box to be cut. The workman is to be understood to be placed at *W*, on the other side of the box, the two parts of the hinge of the frame and iron bar being connected in the usual manner by an iron pin.

I would advise the workman to stand on a log or some eminence, for reasons which shall be explained in the sequel.

It is too obvious to need remark, that by help of this improvement the workman does as much at one stroke as without it at three. The ground on which the machine stands, being clean, as soon as the meat in the box is cut, and the instrument raised by the workman, a boy may at one brush clear the box of the cutten meat on to the ground, and lay in fresh, and so on, till enough for one foddering is prepared. The reasons for my advising the workman to stand on some eminence do, I dare say, already appear to you, gentlemen; for, in the first place, by this situation he will have much more power in managing

managing of the long handle; and, in the second, he will with much more ease raise the frame sufficiently high to allow the boy room to clear and refill the box; and if the master is afraid of any mischief which may happen to the boy by the carelessness of the workman, a catch may be contrived, which the boy may move backwards and forwards to secure himself. But indeed a careful workman only should be employed in this work. If the knives are good, and kept sharp, which they may easily be, if preserved from canker by the machine's being within doors, a great deal of work may be dispatched by a man and boy with this machine in a little time.

I am, GENTLEMEN,

A friend to all improvements,

East-Newton,

(And therefore to you)

March 21, 1764.

THO. COMBER. jun.

N U M B E R XLIII.

Of the Uses of Furze, and the Impropriety of cultivating it in England.

GENTLEMEN,

IT may be a faulty omission in Mr. Miller, that in treating of furze he seems to think it of no other use but for burning; as other uses of this plant have been long and generally known.

One of them is the cover of helms for carriages, and cow-houses for great cattle, swine-courts, and such like, where the expence of a better cover would be imprudent.

Furze, or whins, as they are usually called in this part of the world, if cut, and suffered to lie till moderately dry, and laid on judiciously, will continue a drop-dry covering for several years, especially if bound tightly by a slight cover of straw.

Another use of them is winter-meat for sheep, which will certainly brouze upon them as they grow, especially

when they are *young* and *tender*, and more particularly if the pasture be short, and the winter sharp.

Your *Caernarvonshire* correspondent, who signs himself A Member, &c. at the bottom of Numb. LXXII. Vol. I. asserts, (in page 312.) that his countrymen give this plant, prepared by a machine, which he slightly mentions, to horses, which derive from it health, strength, and spirits.

This fact I can easily believe, both because the plant appears to have strong juices and salts, and because I was assured by a *Lincolnshire* gentleman of credit, that in the last winter (when all expedients for a *succedaneum* to the usual fodder were sought after) more than one post-master, who kept horses for the road, fed them chiefly, or entirely, (I cannot say whether) with *grinded* furze, and had them in as good health, strength, and spirits, as with any food.

As a want of fodder may happen to the best managers by an hundred causes, it is a desirable thing to know how persons in like exigencies have prepared the best *succedaneums*; it would therefore be very obliging to the public, if your correspondent would send to you the best description, in words and delineations on paper, of the machine, (which he says “cuts and bruises the furze at the same time”) which he can procure.

And it were to be wished, that the machines used by the post-masters, of whom my friend spoke, could also be procured, that the comparative value of them, and any others which can be obtained, may be ascertained.

Your correspondent supposes that the spines of the furze, which would otherwise prick the mouths of the horses, are broke by the machine he mentions. However, I own myself at a loss to conceive how any thing which does not actually grind, can so blunt the points of the furze as to make them safely eatable by horses. I do not mean, however, to dispute the fact; for I can as little account for sheep's being able to grind, with one row of teeth, the furze sufficiently to prevent the points of
this

this plant's hurting the stomach and bowels of this animal.

And here (by the bye) let me observe a *strange* but *incontestible* fact, which seems nearly parallel, *viz.* that cattle safely brouze on living yew-trees. Nor will the converse appear less strange, *viz.* that they cannot safely brouze on the *clippings* or *dead branches* of yew-trees.

But after all that can with truth and reason be said of the uses of furze, in order that where they *do* grow, they may be put to the best use, yet I am amazed to find that any person should *seriously* propose to cultivate this plant in *England*, and even to give premiums for sowing the greatest quantity of acres with it, as your correspondent proposes (pages 311, 312.); and one of you seems to encourage the proposal.

Near this place are grounds of all kinds and values; and I will venture to affirm, that it would be a great loss to cultivate furze on the worst soils which would bear this plant to *any perfection*; and if it be not grown to *some degree of perfection*, it can never be cultivated to any reasonable purpose.

Your correspondent rightly observes that furze will not grow on *any* soil that is *very wet*, (p. 312.) In truth, they will not grow to any *considerable* degree of perfection, except on soils which are *dry*.

Now *dry soils* are well known to be easily made good corn-ground, the manure which is put into them continuing a good while. The same culture is to be given to the land on which furze is to be sown, as to land on which corn is to be sown. If the land is very poor, it will bring a very poor crop of furze, unless manure is bestowed upon it. The same expence then which attends sowing of a crop of rye, attends sowing of a crop of furze, except the price of the seed: but this difference of expence is a mere trifle, compared with the superior benefits resulting from the former crop. The rye is reaped the summer after it is sown. With a single ploughing a crop of oats follows in the second summer; and the manure bred by the straw of the rye and oats, will

will enable the farmer to sow a crop of turneps in the following summer, which, if eaten where grown in the winter, will fit the soil for a good barley-crop at least, with a little assistance; or if the farmer plucks and houses them for winter use, he may, with a part of their value, afford a manure to his ground, and after a fallow take a crop of rye, and so on; while the manure occasioned by his home-eaten turneps will fatten another field. Nay, he may pluck his turneps early, and sow hard corn as usual. In the mean time, what has the sower of furze? Nothing till the third year; then a crop of furze, and nothing again till a third year.

And now comes the worst part of the story; for furze is a *great destroyer* of ground, as may be evident from this consideration. Plough up any ground, in which furze grows in beds: manure it equally: when your crop of corn comes up, you will easily know, by its thinness in particular places, where the furze-beds have been.

So that the crops of furze, planted according to your correspondent's proposal, will every one be worse than the preceding; insomuch that, if the farmer will proceed in this wild husbandry, he must stub up his furze, and lay on a prodigious quantity of manure, or he will sow it down with furze-seed again to no purpose.

My conclusion therefore, gentlemen, is, to make the best use we can of furze whilst they *do* and *must* grow; but to get quit of these exhausters of the soil as fast as possible, and rather to propose premiums for those who shall *most effectually*, and at the *easiest expence*, clear the greatest quantity of acres of this pernicious weed.

Proper tillage will keep them down whilst the ground bears corn; the scythe will *generally*, yet not always, destroy them in meadows: but, I believe, in many pastures, where the ground is much impregnated with the seeds, nothing will keep them down effectually, unless sheep.

We are so much plagued with this weed in this part of the world, that we consider the clearing ground
of

of them, as one of the surest signs of a good husbandman.

I am, GENTLEMEN,

A friend to all real improvements,

And consequently to your design,

East-Newton,

THO. COMBER, jun.

March 21, 1764.

P. S. In places where lime-stone is found, furze often grows. Now, if it happen that both *coal* and *wood* are very scarce, as furze judiciously managed will burn lime very well, there may be some reason to indulge a place (as irregular precipices, &c. which cannot well be cultivated) to this plant.

The damage done to the fleeces of sheep by furze, seems likely to balance any advantage got by their brouzing on this plant. It is usual, in many parts of this county, for the persons who have sheep on commons growing furze, not to be at the expence of stubbing them, but to set fire to a large tract of them, (of so little value they seem) that the grass may grow among the stalks, and afford the sheep some picking. But I apprehend that the dirt which the fleeces contract from this *slovenly husbandry*, may be a considerable balance to the benefit. I think, gentlemen, the machine for grinding furze may be of great service to the poor, who have a right, on furzy commons, to have furze for cutting; since, if grinded furze be good provender for horses, it may be so for the poor people's cows.

The negligence of the carrier occasioned my not seeing, till I had wrote all the foregoing letter, a piece addressed to you on the great benefit of furze as food for horses. (See Number XLIV. Vol. I.) The ingenious writer, *Rusticus*, has anticipated two of my sentiments, *viz.* "the great utility this plant may be of to poor people, " who live in the neighbourhood of large commons overgrown with it, as food for cows in winter when fodder " is dear, &c." and the wish, that any body possessed of

a mill for grinding this plant, would communicate its construction to the public. (See page 410.) However I shall not blot out those parts of my letter, (neither probably will you) as the united suffrages of your correspondents for trying of experiments will be most likely to carry them to effect.

One of you, gentlemen, who signs himself *E.* judiciously observes, that as rabbits, hares, &c. as well as sheep, are fond of, and quickly destroy, young furze, the land sowed with furze should be fenced with close hedges; so that the expence of hedging very well, (a considerable part of the expence of improving waste lands) attends the culture of furze no less, if not more, than that of corn.

I have only to add, that I remember to have seen, in the lightest soils in Bedfordshire, very neat clipped hedges of furze, raised on well-compacted banks. The clipping rendered them thick, and (upon the whole) a very good fence.

If any body still thinks the sowing of furze a prudent scheme, let him tell us how long an acre sowed with furze will, in the third year, keep any number of cows, or horses, or other cattle; and then we will compare the profit of corn and turneps in the same space.

March 26.

NUMBER XLIV.

On curing Cattle holed by eating Clover.

GENTLEMEN,

PERMIT me to assure you my long silence has not arisen from a failure in inclination to contribute any thing in *my power* to your useful work, but really from the application which my duty here requires, which, I hope, may hereafter prove of some use on your side the water; and this I request may be admitted as the true reason

reason for my not having complied long ago with the several requests you, and several of your correspondents, have been pleased to make to me: and I beg leave to assure you and them, that I shall ever make it a point, when my other avocations will admit of it, to communicate every matter, which arises in the course of my observations, that can in any degree contribute to the public service.

I trouble you now, gentlemen, upon a subject which I have long intended, although, I assure you, quite disagreeable to me: but before I enter upon that, I cannot omit to return my thanks to your several correspondents, who have so *obligingly* answered my enquiry respecting the operation of stabbing cattle when swelled by the eating clover, by which answers I think the public is served.

By looking over those letters, I think it will be found, that the subject was pretty fully explained before your correspondent, Mr. P. H. Numb. VI. page 33. Vol. IV. gave his sentiments upon it, who comes, like a soldier, returning to boast of a victory, when he had run away from the battle.

This gentleman says, “ though I am very well inclined to your undertaking in general,” yet he thinks “ your papers *has* some conjectures, which, in my opinion,” says he, “ must rather puzzle than help the *plain country* farmer.”

It will undoubtedly be admitted, by every lover of his country, that you, and the public, are much obliged to this gentleman for his being so “ well inclined to your undertaking.” To “ puzzle the *plain country* farmer” is certainly very unpardonable; but the “ *plain country* farmer” is much obliged to this gentleman for his very explicit and intelligible manner of treating the subject before us, as I shall shew presently: and really, when such very clear and explicit writers, as he seems to be, take a subject in hand, after your correspondents, A Devonian, the Rev. Mr. Wallis, the Rev. Mr. Comber, &c. had wrote upon it, how can the “ *plain country* farmer”

“farmer” want information? Those gentlemen, I suppose, wrote for the information of *town* farmers, which I expect to hear of, from this gentleman’s so *emphatically* distinguishing the “plain country farmer.”

After the above introduction of himself, he says, “Among these, give me leave to *single* out a correspondent, (see Vol. III. page 113.) who comes with his “glister-pipe, and his drugs boiled in three quarts of “water till they *come* to two; that is, he is two or three “hours in preparing a medicine for a malady, which, to “*my certain knowledge*, kills in seven or eight minutes.”

Thus this gentleman has been pleased to “*single*” me out as a subject upon which to shew his erudition, his power as a writer, his politeness as a gentleman, and his truth and veracity: he says, I *come* with my “glister-pipe, “and drugs boiled in three quarts of water, till they “*come* to two.” He is very fond of the word *come*, because, in this place, I presume, he thinks it polite language. Now, by referring back to my letter, it will be found, that the three quarts of water “were *reduced* “to two, by boiling.”

Again: “that is,” says he, “he is two or three hours “preparing a medicine for a malady, which, to my “*certain knowledge*, kills in seven or eight minutes.”

By this gentleman’s manner of writing, in the succeeding part of his letter, it seems to me he ought to know the proportion of time *evaporation* requires, as well as the time such a “medicine” would take to prepare it; for it will not take three, or even two hours, as he would insinuate. But what is still more extraordinary in this paragraph of his, is his saying, the malady before us, “to his *certain knowledge*, will kill in seven or eight “minutes.” By this passage, *his* veracity or *mine* comes in question; for in my letter, my cow is described, and truly as the fact was, to be ill from the evening of one day till the morning of the succeeding one, a good part of which morning, from the hour of *three*, (which was the time I said in my letter the shepherd called me) was

spent in my going to a butcher to make my enquiry, which I mentioned also. For the service of the public, I sent the letter he has attacked, to your *Museum*, and in that letter said, page 16. "I do not offer this as a remedy
 " that can be practised in general. This remedy is not
 " offered as a general or certain one; but I am moved to
 " offer it, with an hope, that some capable person will
 " furnish us with an accurate information of the operation by the knife, as I know it is practised in England
 " with certain safety and success, &c."

Now, as there appears upon the face of *his assertion*, and *my letter*, a rude and positive contradiction, I beg leave to ask, whether it can be imagined, that a beast will die "in seven or eight minutes" after being distempered by eating clover? No: *fact shews the contrary*; and why a man should so *abruptly contradict and insult a truth*, seriously related in every stage of it, *avowedly with no other intention* than to procure the public an information which was of importance to be known, will surprise every *lover of truth and candour*: for if what this gentleman asserts, namely, that the "malady will certainly
 " kill in seven or eight minutes," could possibly be true, I must have been writing five pages of lies, which I see is the length of my letter, which, from the number of them, would be more unpardonable than his positively asserting an apparent falshood in two lines.

I would ask this gentleman if ever he saw a beast fall dead in seven or eight minutes after eating clover? For in page 34. he says, "While the beast is swelling, it is
 " very uneasy and restless; but as soon as ever it falls,
 " there is instantaneously an end of all motion and
 " struggling." Only let us conceive what a rapidity there must be in the generation of air, to kill a beast "in
 " seven or eight minutes" after taking the clover, or even after the first stages of the disease.

Upon the whole, I shall only ask you, and every candid reader, whether this person writes like a gentleman? Whether so confidently asserting what cannot be true,
 to

o the insulting of another, who, from his manner of writing, claimed no other merit than that of aiming at a useful remedy being universally known, to speak in the softest terms, does not shew this gentleman to be a man of too much importance to give himself time to consider truth and decency? Will any one pretend to say, that the paragraph he has levelled at me contains either language, argument, or good manners? No; they cannot: and I am persuaded, when he himself comes to consider it, *if he be a man*, he will be ashamed of it.

I shall now proceed to examine another part of this gentleman's letter, respecting his manner of accounting for the disease before us.

I have no doubt of the air-bubbles being to be found as he describes. "These," he says, "are taken down with the clover, which, *being dilated by the heat of the stomach*, swell it so immoderately."

Where is the difference between his idea and mine, as to the generation of the air which disorders the animal? In my letter will be found, "We know that fermentation will excite air; and I conceive the animal heat rarefies that air." Is not his heat of the stomach an "animal heat;" and is not the rarefaction of air the same as as its being "dilated?" Are we then obliged to him for this explanation?

He says, "As oxen and cows *never* chew their meat, but crop it with their tongue, and swallow it directly, it is easy to conceive how these air-bubbles should be conveyed into the paunch unbroken."

First, I shall say the assertion is a mistake, and consequently the conclusion is erroneous.

As to black cattle cropping their food with their tongue, the fact, I believe, upon examination, will be found otherwise; for the truth seems to be, that by the roughness of the tongue, they draw the grass against the teeth in the upper jaw; and by drawing the tongue along the grass, at the same time that the tongue presses it against the teeth, in which it is aided by the roots of the grass holding

holding it firmly to the ground, the roughness of the tongue operates like a rasp in separating the grafs from the ground : the grafs being tender, that friction between the tongue and teeth reduces the grafs to a kind of pap, when the beast can swallow it very readily. But to say “ they never chew their meat,” is so general that it seems to be as wide from the truth, as their dying in “ seven or “ eight minutes” by the malady before us. How do they eat straw, hay, turneps, cabbages, corn, and many other things ? Let this gentleman look at a beast, when eating any such thing, and he will find himself greatly mistaken : for surely the action of chewing is a friction upon the food, by a regular motion of the jaws, acting somewhat like forceps ; and the practice of this action will be apparently seen by looking at a beast when feeding. And, in order to illustrate this yet farther, I would ask this gentleman, why is it that an old cow will die of hunger, when she has lost her teeth ? Is it not because she cannot chew her meat ? By proving his mistake in this particular, his conclusion of the air-bubbles being conveyed into the “ paunch unbroken” falls to the ground. Indeed, without this proof, the argument could never stand : for how can any gentleman, who attempts to account philosophically for an effect, attempt it upon principles so contradictory, as, first, to say these air-bubbles pass *unbroken* into the paunch, and then, in his note, describe them as being covered with “ a thin watery case,” which every man, nay, every child, knows will break by the least touch or shake ? That being their texture, how can they withstand the approach of a beast’s nose, much less the rough action of the tongue and friction already described, so as to pass “ un- “ broken into the paunch of the beast ?” when every man of common attention knows how small a matter will break the thin cases he describes, and therefore unlock the air contained in them, which will *instantly unite and incorporate* with the *air at large*.

Indeed, if this gentleman had urged, that in all fluids there is more or less air, and that as clover had the effect described,

described, when under heavy dew or rain; and that the beast swallowed such a proportion of air as the fluid contained; and that as soon as the action of digestion begins, (which, I believe, he will not deny to be an effect of fermentation) the animal heat rarefies the proportion of air so contained in the fluid adhering to, and swallowed with, the clover, I believe it will be allowed he would have been nearer the truth. To demonstrate this yet further: turn two beasts into clover, when the *dew is off and the grass dry*; and after feeding there, drive one of them to water, and keep the other from it; and the consequence will be, that the beast which shall drink will swell in the manner heretofore described, and the other will not be apparently disordered. Where will this gentleman's air-bubbles come from then? Certainly the beast will have swallowed air in proportion to the quantity of water taken: but the truth is, the water hastens the efforts for digestion, in which fermentation aids; that will generate air; that air is rarefied by the animal heat, and death will ensue to the beast, if relief be not administered.

This gentleman says, "Your collection of papers has some conjectures, which," in his opinion, "must rather puzzle than help the plain country farmer;" to support which, he falls upon mine.

I would ask, whether it can be thought the "plain country farmer" will be less puzzled with his "*chimera, globules of quicksilver, circumambient air, attraction, elastic snap, granulates, pus, abdomen,*" and above all, with "*Dr. Cheselden's Treatise of Anatomy,*" than with the simple relation of a cow being relieved by the use of "a glister-pipe and drugs," as his politeness has been pleased to call it?

I shall now pass over the rest of this gentleman's letter, till I have more leisure to animadvert upon some other wanton parts of it, in which, I am sorry to say, I have full room enough. In the mean time, I think it my duty to communicate some circumstances, which I have lately met with, relative to the operation of stabbing hoked cattle,

cattle, and how to guard against the disease when cattle are to be pastured upon clover.

I have lately met with a gentleman, who, for many years, has made it a practice to relieve cattle swelled by eating clover, by the operation I sought after in my original letter on the subject: his practice of it has been so great and successful, that he treats it as an operation of the greatest ease and safety, provided the necessary precautions are observed. He says, the teguments of the paunch are composed of fibres, like threads, which we see indeed in tripe, and that they run from the back to the belly, and that therefore the incision must be made perpendicularly, by which the wound will heal again without injury to the beast: for it is easily imagined how the knife passes between the threads, if I may be allowed the expression, when the side of it is presented in a parallel line with them. But if the wound in the paunch, by the hand of an unskilful person, be made horizontally, *i. e.* a-cross the threads, it will never heal again; for in that case, the teguments will be cut transversely, and the gravity of the paunch, added to the quantity of excrement with which it is always loaded, will keep the wound open; and this he exemplifies by a stocking; for, says he, if a stocking be cut a-cross the threads, and be then strained, the cut will gape; whereas, if it be cut lengthways with the threads, and be then strained, the cut will hardly be discernible. This argument carries such conviction with it, that no more need be said to enforce an attention to the direction of the knife, which he describes. He says the point of the knife must incline downwards, for otherwise there is danger of wounding vital parts under the back, approaching the kidneys. The place in which to make the incision is that which I described in my former letter.

When black cattle are to be pastured upon clover, the disease attendant on it may be prevented by the following practice.

When they are first turned into the clover, they are to be full of common grass, and let it be in the middle of a

dry day ; and thus every day lessen their food of common grafs, and encrease their food of clover, by which practice, in a week's time, they may be left day and night in the clover without any sort of danger.

Thus, by the assistance of your obliging correspondents, and this gentleman's information, I have the pleasure of seeing an operation of great consequence to the farmer and grazier rendered public, for the general service of mankind ; and as my letter has been productive of so general a benefit, I am the less concerned at the criticism of Mr. P. H. who therein has neither shewn decency or argument.

I am, GENTLEMEN,

With great esteem,

Your most obedient, humble servant,

Ireland,

AN ENGLISHMAN.

September 5, 1765.

N U M B E R XLV.

*An Essay on Timber-Trees.—Written in the Year of our Lord, 1645, by Mr. Jo. Hall *, of Skidley, in Yorkshire ; and revised, corrected, and transcribed, in the Year of our Lord, 1765, by Thomas Comber, of East-Newton, in Yorkshire.*

BUT ere I begin to speak of timber-trees, I will shew you, in brief words, what I mean by timber-trees. I mean by timber-trees all such kind of woods as have great bodies, and are great trees ; of which are builded houses, mills, cloughs, ships ; and of which are made beds, cup-boards, tables, chests ; and also all manner of vats for tanners, brewers, and also all kinds of other casks ; and likewise all carriages, great engines, instruments, frames, and utensils of husbandry and other artificers.

In

* Some further account of this Mr. Hall will be given in a future number.

In ancient time, almost all great frames and buildings were made of oak; but in latter, for the scarcity of this noble tree, men were compelled to use any wood fit for the same; as beach, elm, hornbeam, walnut, chesnut, yew, ash, plain-tree, willow, asp: only because those have the greatest bodies, they are used in the strongest building.

The elder, the maple, asp, fallow, birch, poplar, white and black linden, quickbeam, fir, service; these are used in more slender matters. Of all these I will speak in order in their several places, of their plantings and orderings, as my knowledge and many years trial will enable me, and the good assistance of the divine inspiration will permit, that my willing countrymen, the *georgephiloi*, may receive some help and instruction thereby, and be the more encouraged to learn and understand their own profit, and better to improve their lawful and right inheritances.

First.—Of the Oak.—Of all the timber in this island, oak for his antiquity, profit, and nobility, deserveth the first and chiefest place; for of ancient time the Druids, who were a kind of superstitious priests, kept their *sessions* under this tree, as attributing a kind of holiness to this tree; whose opinion I neither allow nor commend: but I rather desire all countrymen to plant the same, as a thing most needful for to maintain their buildings, carriages, and instruments; *quamobrem* I will shew my judgment of his planting.

He is planted in October or November, when the mast, that is, the acorn, falleth from the tree, before it be too much dried. You may sow it or set it in well-cultured ground, and keep it so as no hogs, nor other creatures, devour or spoil it. And at the first it will grow *very thick*, that is, *near together*: then, after few years, you may remove them by drawing out either all the *least* or *greatest* into another place, about two feet asunder. Then, when it is grown to some bigness, you may set them on cold sides of your orchard; for his roots spread not far, his shade and droppings are not much noisome.

The slowness of his growth wearieth the patience of many people ; yet his profit countervails the pain in succeeding times ; for the wood thereof is very strong, lasting, and solid, to make any kind of great buildings, engines, carriages, chests, or other utensils. Likewise where there are many, the mast thereof will feed hogs and deer admirable well, without any help. I heard Lady Darly say, in a discourse, “ The bacon that was killed for their “ house use one year, was all fed with that mast only, “ without any other thing.”

There is a kind of this wood, called *wairscot* ; some bred in this country, which is a flowered wood ; other brought from foreign lands. And, in general, all estates and degrees had need to further and countenance the planting and nourishing of this tree ; the nobility for the shade, and feeding of their game ; the gentry for making desks, and cieling rooms ; the merchants and seamen for shipping ; the husbands and yeomen for buildings and carriages ; the poor for *fire-wood* and *fuel* ; so, in general, necessary for all.

Skidley, April 19, 1645.—Of Beach.—Next in order I prefer the beach, little inferior to the oak. As it is known to *few*, so the planting thereof is neglected by *many*. I have diverse of those trees growing in my orchard, which I fetched from *Hinderskelf* a few years since, about *St. Luke's Day*, the *mast*, that is, the *nut*, then falling. These I planted, as I have formerly written of the oak. He hath a great body ; long *keneled* leaves, somewhat like the chesnut ; a great root ; a three-squared nut, two or three of them enclosed in a rugged coat, (like an acorn-shell, but covering them all) which openeth in *October*, and then the *nut* ripeth and falleth out. In *Ovid's* time it was used as a dainty to entertain their guests ; now it is only esteemed as mast for *ungentle cattle*. When they are waxen great, you may plant them round about your yard, or other grounds, two or three yards asunder. It is both a *timber*, and also a fruit-bearing tree.

Of Walnut.—The walnut is also *very hard* and *strong* timber ; and if you keep it *without* lopping, it will grow

to a great body. I have written of his planting formerly, in the Treatise of Fruit-Trees. His shade is supposed to be hurtful to the head, so consequently apter to be set in closure than in gardens or orchards.

Of the Chesnut.—And though he be a fruit-bearing tree, as I have shewed before, yet in our country it is barren, yet a *hard timber* tree; and because he shooteth sprouts forth at the root, he is a good copice. You may use him as you please. I bought some of the nuts at *Hull*, at the latter end of the year, a few years since, which I planted in my yard; whereof I have at this present trees to show. They will grow, as all other trees, the better if you nourish them well. I have already spoken of their planting in *France*. They bear a great mast, wherewith they feed their venison. Our country is too lateward for them: in the southern part, I think, they would be very profitable, used with discretion.

Of the Elm and Hornbeam.—The elm is a tree not very common, and so not much used, in regard of the rarity of his planting, which is not known to many countrymen. Of these trees there are two kinds, the *elm* and the *hornbeam*, both much alike, and good timber.

The elm, which beareth the greater and fatter leaf, hath a strange nature, degenerating from the most part of other trees: for, as the most part of other trees beareth his fruit or seed in the latter end of the year, this tree beareth his seed in the spring of the year, about *May*, before his leaves, like the *herba tussilago*. It appeareth at the first brown, and then [groweth] to a thin leaf like hops, in which thin leaf, in the midst, is a thick round rising on either side, the bigness of half a lemon-seed, grain, or corn, which is in taste like turnep-seed, which is the seed the elm groweth of. I have diverse times sown the seed, and have a good few of those trees. It is a hard, tough wood, good for timber, and many other uses, as making bows, for coppice. His shade and roots are gentle, his droppings and leaves not noisome, therefore good on the cold side of your orchard; his lopping
good

good coppice to repair your fences, and the tree good quickwood. There are but few in our country. I had an old stock, which I only kept for the seed to plant; other I did not know any in diverse towns near us.

The other, called an *hornbeam*, is a tree much like to the former, not inferior in goodness; only his seed is not well known, as not like the other. Where he is once planted, his root runneth along the bank like the aspen, or most kinds of stone-fruits, and springeth up young sprigs, whereof this tree is, for the most part, planted. Some affirm it will grow well enough [of] the chips, when and where it is *lopped*. Both of those kinds have rough leaves, like the *hasle* or *filbert*. He hath great body, good for timber, will not *chink* nor *cleave*, apt for *naves* [and] water-pipes. His coppice is good to make fences, and the tree good fuel or quickwood. Once planted, this almost never fadeth without great violence. I once saw, at *Scarborough*, the greatest trees [of this kind] that ever I saw in all my life, for *height* and *thickness*. Both of these will grow and prosper well in moist and rich ground.

Of the Ash. — The ash is a tree very frequent in our part of the country. It is planted of the seed, or kernel, commonly called the *kittle-key*, in the end of summer. But if you have ash-trees growing near your gardens, you need not to plant them, for they will plant themselves. It groweth to a complete body in a little time. He is a tall, tough, and serviceable tree for countrymen, to make cart-wheels, axletrees, ploughs, and other necessities; for timber; in fire-houses sweet fuel; and apt for many other uses. Yet I cannot commend this tree to be near your orchard; for he is an enemy diverse ways to fruit-trees. First, his roots being *great*, *hard*, and *dry*, they fret and cancer the roots of other fruit-trees, and suck away the moisture from them. Then the shade and droppings; the [one] with-holdeth the dew and rain from the trees under; the other, with his four droppings, hurteth them, and therefore not good so near; as any of these annoyances may hinder them. Yet you may plant these at the outsides

of your yards, one from another, as we commonly do in our town and country.

Of the Plane-Tree.—Because the plane-tree is a tree much like to this, in planting and growth, yet differs in use, office, and leaf, I intend to place him next. He is planted like the ash, and will plant himself as the ash will, if he grow near your garden. He hath a smooth skin, goodly body, a broad leaf like to the maple, and also his seed, but greater. His wood is more soft, brittle, and fading, yet good to make harrow-bulls or beams, fold-bars, kiln-rocks, mill-bars; and also good for fuel; which, in conclusion, consumeth all. It is not very common in our country as yet; but being a tree easy to be planted, I think it will encrease, by reason of his great leaf for shade in gardens and orchards; for his root and shade are very gentle.

Of the Willow.—The willow is a tree of a quick growth, great body, clean skin, soft wood, and fading long leaf, complete stature. This tree, for the most part, is planted of the cutting off from another tree, as thus: in the spring-time, about the end of *March* or the beginning of *April*, we take as many of the fairest branches as may be provided, which have been lopped from some other willow-tree; and beating down a pile of wood with a bittle, in moist and rich ground, about a foot or more, we set the branch in the hole, cutting off all his boughs, leaving him about ten or twelve feet long; or leaving him one upright top, we bank him about with moist earth, and binding him about with thorns, that nothing rub to loose him for two or three years; so in short time both his body and head, or top, will grow to a great bigness. I myself, in the yard where I now live, have had in twenty years the head of a willow, [whereof] one branch made me four swathe-rake heads, and a ladder of twenty steps long, with which I use to gather my fruit. It is likewise good to make bellows, bowls, yokes, and many other good utensils, besides good fuel, and for fencing. It hath a seed, which I take to be the proudest and fairest buds.

[These]

[These] falling off in the deep of winter, in moist and gentle earth, will likewise grow and be trees.

Of the Aspen.—The aspe is a tree that groweth very high and small; his skin clean; his wood white, soft, and fading; his leaf round and wavering, or trembling. His root runneth along in the ground, and shooteth forth scyons, of which he is planted. He groweth to an exceeding great height. He is not very good timber, nor coppice. Once lopped, he never putteth forth. He is good to make ladders of, fold-bars, mill-bars, daubing staves or stowers. He is longest lasting that way. He hath no known seed, but planted of the scyons. Thus much of the first kind of timber, and largest, and their uses. The rest followeth.

Of the Sallow.—Sallow is a kind of tree growing to a large body; and therefore I thought it necessary to be placed amongst the number of timber-trees. He is planted very well of the branch in the spring time, about the end of *March*, or some time in *April*, in moist ground, as is the willow and poplar. Nevertheless he hath in himself a kind of seed, which falleth from him in the deep of winter, which (as I suppose) is some of the fairest and proudest buds. Some few years since I had many hundreds of them grew up confusedly all over my orchard, which I afterwards removed and placed, as you may see them grow here abroad in these yards. They grow speedily, and are a fast, hard, tough, and solid wood. Of them there are diverse kinds, differing one from another, viz. *yellow*, or *sweet fallow*, *black*, *green*, and *red fallow*. They differ very little one from another, so as you cannot know neither in summer nor winter; only by the palms in the spring you may know them. 1. The yellow fallow is that which hath a yellow and sweet palm in the spring-time, whereon bees feed most plenteously, for it springeth first of them all, which I love best. It is good to be planted near your bee-garden. Yet his wood is the *softest* and *brittlest*. It will not make quarter-clift oxen-bows on any reasonable condition; yet will it make yokes, and
many

many utensils of husbandry very well. 2. The next in order is the black fallow, little differing from the other, save only it hath a greater body, a greater and green palm, groweth faster, and is more solid, harder, and tougher; planted after the same sort, and good for the same uses. He loveth a moist ground, and a rich. He hath the greatest leaf and palm. [His] body is the hardest, and groweth the fastest, of all the rest. 3. and 4. The green and red fallow are like the former, but have less palms, and blacker. They are all planted and set after one sort, and grow all much what alike; their wood of much like quality, and all apt for like uses; save the last three are tougher coppice, and so more fit to repair your fences; therefore they may be set about gardens or orchards. Most of these I have growing here in my own plantation, of my own planting, as is here described. They love *deep* and *moist* ground best.

Of the Linden-Tree.—The linden-tree is a soft wood; yet in it will breed no worm, and hath between the bark and the wood sundry thin rinds, whereof in some places are made ropes. Usually the flax or line that cometh out of the Low-Countries are bound up with such rinds. How it may be planted, let men of younger years, and abler bodies, search out the mystery.

Of the Maple-Tree.—The maple-tree is a kind of timber not small in respect of his growth, but in respect of his uses and planting. He hath a tall body, rugged bark, three-cornered leaf, and seed, or kernel, like the plane-tree, but lesser. It is planted like the plane-tree in all points. His wood is *white* and *hard*, *smooth*, and something flowered. He is used to make drinking cups, harrow-beams or bulls, of. Being tempered in oil, and seasoned, it is good to make musical instruments of, as the *shalme*, *recorder*, *flute*, and *fife*. I cannot commend it for fuel, nor for fencing; for it is a very brittle wood.

Of the Alder.—If you use this tree for any timber or durable work, you must *raie* him thorough, or else he will soon fade. The alder-tree is a plant of no small reputation,

especially in *moorish* and *marish* grounds, where, in many places, they grow very plenteously ; for it loveth *moist* and *rotten* soil. The nature of the ground is of great force, as with all other trees and plants. It is planted of the seed, at the latter end of the year, as most part of other trees are, except the *elm* and *box*. He hath a sound body, red wood, and moist and stinking bark. It is tough for fences, and lasting enough. For fuel he is so four he will scarce burn. He is lasting and durable for water-work, and good timber for the roofs of houses. His planting is *mystical* and rare. In they make pails and rails of this wood to preserve their fodder, and also gates and bridges.

Of Birch.—This place I attribute to birch, as a lover of the same soil, and so consequently a companion to alder ; for both of them will very well digest the violence of cold and wet grounds, which many other woods will not. It is a streight and tall tree, with a brown bark, and a round leaf much like the aspe. His wood is white and tough, and used to make arrows, dishes, ladles, and such wooden vessels of. But the most memorable virtue or use of him is, he is very terrible to dull and *mal-apert* school-boys, and useful and painful to kitchen-boys for brooms. He hath a seed, not known to many, whereof it is planted in the beginning of winter. You may procure this tree from some woods near the country. I have some of them in my grove, of my own planting. He is a *sweet* and *healthy* wood, and very good and tough coppice for fencing, and so worth your labour, in respect he will thrive well. In cities they use thick branches to trim up their summer-parlours. At *London* I have known much money given for a man's burthen of these branches for that use.

Of the Yew-Tree.—Something is to be said of the yew-tree, which I omitted in my treatise of greater timber. Yet although I be not very well acquainted with this tree, it hath a thick body, red and white wood, hard and tough, good to make *naves* and warfare-bows. His leaf is like

to ferns or brakes. About *Tekell*, in the south confines of *Yorkshire*, they grow great, and in great plenty. It is planted of the seed, which is like small lentils. In the parts near *London* many of their wheel-naves are of this wood: few grow in our country, except in some gardens.

He loveth a moist soil, and is planted in the end of summer.

Of the Poplar.—Of this tree there are two kinds, the *white* and *black*. They both are soft, and light, and white wood, much like to aspen. They both grow best in wet ground, as being a near neighbour to the willow; and are planted almost like willow, of the branch in the spring-time. As yet I have seen no seed nor berries growing on them. I have three of the black kind growing in my orchard, which I planted of the branch. The leaves are much like an aspen leaf, but smoother and rounder. They have pretty straight bodies, and of good bigness. The wood seemeth to me to be useful for such [purposes] as is the plane-tree; to make utensils for countrymen's employment. They are good fuel, and to repair fences, it being a tough wood and well thriving. The *white* poplar is somewhat like the *black*, save they only differ in leaf; for the white poplar hath a quality, which I know no other tree hath. His leaves are of two several forms or shapes; the one somewhat like some kind of apple-tree, the other sort much like the plane-tree in bigness and all, save herein they differ; the poplar is green on the *fore-side* or *upper-side*, and white on the *back-side* or *lower-side*. He loveth to be planted on ditch-banks near water; for he liveth like his brother, and is a marish tree. His wood is good for such uses as other light and soft woods are, and so is his coppice. I brought one or two of them from besides *Huntingdon*, as I came from *London*, which I planted in my grove; but, I think, my ground was not moist enough for it.

Of the Quick Beam.—This is a tree of very little acquaintance with most people, and of no great consequence. It hath a body, and boughs much like to a *fruit* or *berry* tree,

and leaves like the liquorice plant or briar; berries like the dog-tree berries, red, and many in a cluster, *viz.* at after-end of the year. There hath been a *superstitious opinion* amongst ancient people, that this tree is good against the enchantment of witches. There is of them in many woods. They are planted of that berry which groweth on them, and is ripe in the end of summer, of the scyons, or of the slips, and love moist ground. There is of them in *Cliff-Wood*. His coppice good; his timber not great nor tall. It is harder than ash, and closer.

Of the Service-Tree.—The service-tree is a tree in likeness like this in his growth and berries, save his berries are good to eat. In *Lincolnshire*, near *Borne*, I have sometime tasted of them, where they grow wild in their woods. They are ripe at the latter end of the year; and of this berry this tree is planted. His timber is used to make frames to fodder cattle in, and daubing-slaves for horses. He is both timber, fruit, and coppice.

Of Fir.—The fir-tree is a timber at this time much in use, though an outlandish plant, and growing *not out* in our country. It hath a tall body, and freight, a leaf like yew, a kind of hard fruit and rugged, whether you call it an *apple* or *nut*; in which is contained a great number of seeds or kernels, of which the tree groweth in *Poland* or *Swedeland*, where they grow. It is wonderful good timber for diverse sorts of buildings, and diverse ways *fit* and *apt* either [for] small or great timber, planks, boards, deals, joists, pails, masts for ships, cieling for houses, planchering ploughs, rails, ladders, and many other things, and therefore a most useful timber, [and] not worthy to be omitted; because out of the same issue diverse kinds of gums, useful for many things, pick for caulking ships, tar for marking sheep, rosin and turpentine for other uses; the yellower gums issuing out by natural heat, the other being forced out by fire. Therefore if any distressed man desire to travel and see fashions, I desire him to bestow some labour to seek out the knowledge of planting this tree, and others; either beasts, cattle,

cattle, fowls or fishes, which may bring profit to our nation, or at leastwise some appearance of good-will; which indeed I intended to have done, if God had not *denied* me the use of my limbs, and these troublesome times had not overtaken me.

Of the Larix.—This tree, as it appeareth by *Æsop* in his fable, is a timber-tree; and, by *Cooper*, in his Dictionary, beareth mast, and the greatest next the chestnut; and of them both is called *larix*. It hath leaves like the pine-tree. The timber is apt for building. It will not perish either by *burning*, or by *eating* of worms, nor rotting. It will not consume in burning but by great violence and vehement force. The gum that issueth out of it is called *laricina resina*, and is used for turpentine. This tree groweth very frequently in *Italy*, about the river of *Trent*, as doth the *pine*, *fir*, and *peach*, or *pitch*.

End of the First Part.

NUMBER XLVII.

On the Differences betwixt the Burnets now cultivated in various Parts of the Kingdom.

GENTLEMEN,

IN your First Number of this Fifth Volume, you have favoured the public with engravings of some of the new grasses; amongst which are *Rocque's burnet*, (see Fig. 3.) and what you call *burnet from Yorkshire*. A glance of the eye shews a great difference in the leaves of these two burnets; yet it appears, (see page 62.) that the Yorkshire burnet came from seed originally procured from Mr. Rocque. Now, I should be glad to know whether Mr. Rocque has sowed, at different times, different species of burnet, or is this *apparent* difference to be ascribed to different soils, cultivation, or other accidental causes?

In

In John Gerard's Herbal, (amended by Thomas Johnson, and published *Anno Domini*, 1633) burnet is divided into two kinds ;—*pimpinella hortensis*, and *pimpinella sylvestris*.

The garden burnet is distinguished from the wild by this quality, amongst others, that the whole plant doth smell somewhat like a cucumber or a melon. This herbalist adds, that there is kept in some gardens another species, which is distinguished not only by being larger, but also by the flowers being of a whitish colour; whereas those of the common garden burnet are not only smaller, but of a brown purple colour.

To this larger species he gives the name of *pimpinella sanguisorba hortensis maxima*, or great garden burnet. I take it for granted that your burnet from Yorkshire is that called by Gerard the great garden burnet, as it is taken notice of, (page 62.) that the heads of that burnet, being in full bloom, were of a whitish colour. If I am wrong in this inference, you will correct my mistake; and I doubt not but you, gentlemen, can satisfy my doubt, whether the burnet of your two figures, 2. and 3.* proceeded from seeds taken from the same species, as they both came originally from Mr. Rocque.

I am, GENTLEMEN,

Your constant reader,

Sept. 7, 1765.

Z. Y.

* Fig. 2. is a specimen sent us by the Rev. Mr. Comber, who positively, and we believe truly, asserts, that it was raised from Mr. Rocque's seed—Fig. 3. was communicated by a friend to our work, who procured it from Mr. Rocque's grounds at Walham-Green.—Numb. 6. and 7. are wild species.

NUMBER XLVIII.

Benefit of harrowing a foul Crop of Turneps.

GENTLEMEN,

I Last year sowed some turneps on near ten acres of good light land. Some other business interfering, prevented my getting them hoed in due time, insomuch that, by the latter end of August, they seemed to be almost covered with weeds.

Being willing to endeavour at recovering my crop, I caused the field to be harrowed and cross-harrowed, which set them out pretty well, and cleared away a great number of the weeds, insomuch that the turneps got ahead, and grew to be a tolerable crop.

I send you this for the information of some of your farming readers, who, when they have delayed hoeing their turneps for a few weeks, if the weeds get forward, think they have lost their crop; whereas, would they adopt this method, which has, I think, been more than once recommended in your work, they would find it answer any reasonable expectation they could form. I have several times tried it, and it always succeeded with me more or less. The work costs but little, and the benefit resulting from it is considerable. I have known farmers plough up a crop of turneps which, by harrowing, would have yielded them a good return.

I am, (in haste) GENTLEMEN,

Your obedient servant.

Near Chelmsford, Essex,
August 7, 1765.

S. L. O.

NUM-

NUMBER XLIX.

An Acknowledgment of the Efficacy of a Receipt, published in the Museum Rusticum, for curing the Scab and Fly in Sheep.

GENTLEMEN,

I Think myself bound to thank you for the excellent receipt published in your *Museum* for December last, having experienced it to be what it is there called, "A sure, easy, and cheap Remedy for the Scab and Fly in Sheep."

I must now request, in regard to this poor country, that you will oblige us with a plate of the wind-fan*, or, as it is called in some parts of Surry, a winch, with an explanation of its construction and utility. This will, I hope, induce us to make use of chaff, and must be of great service this year of scarcity.

I am, your constant reader,

And as constant admirer,

Dublin,

MILES IUS.

September 12, 1765.

* We cannot oblige our correspondent by giving a plate of the wind-fan. Were we to give plates of every common implement in husbandry, it would become an article of very great expence, and would not besides answer any useful end. E.



Museum Rusticum, &c.

For October and November, 1765.

VOLUME the FIFTH.

NUMBER L.

Observations on the Importance of Agriculture to Great-Britain; and the Means of promoting the Improvement of it at present, in a Letter to the Editors.

GENTLEMEN,

IT was with concern, I saw a delay made in the publication of the MUSEUM RUSTICUM for last month: owing, as we were told, to an accidental want of a timely supply of proper pieces to maintain the character of your useful publication, and continue that esteem for it, the world has shewn by the encouragement of so great a demand. I hope however this circumstance will have the effect it ought; I mean, that of inciting all those, who are capable of furnishing any material hints or instruction for the improvement of *agriculture or other æconomical arts*, to communicate them to you. Since over and above the service, they, who shall transmit any such pieces to you at present, may do with regard to the particular object, their communications may relate to, there will a collateral advantage arise thence to the public;

Vof. V. No. 26.

I i

which

which is, that of their contributing to support a work so beneficial to it. Besides the utility of your undertaking, your conduct on this occasion seems to entitle you peculiarly to such favour. Instead of publishing trivial and futile matter, or, according to the common practice of editors in like cases, borrowing from the labours of other writers, you have laudably kept up to your pretensions of exhibiting original pieces; and rendering your work a repository of inventions and improvements not before imparted to the public. Your persevering in this measure is, I conceive, one principal cause of the success you have hitherto met with. For, though it cannot be expected, that every article, received promiscuously from those, who through various motives may be induced to correspond with you, will be either of the first importance, or treated in the most judicious manner: yet, among the number, many will be found, that furnish new lights of general utility; while hints, acceptable perhaps to some particulars, may be gathered even from the less significant and accurate. Whereas, in works of this kind, that are only complements from others, nothing is supplied but what is before practised, or at least laid open to the world.

In consequence of this sentiment, and desirous myself to do in some degree, what I recommend to others; I beg leave to subscribe my mite; and present you with the following observations on *agriculture, and the means of promoting the improvements of it at present in our country*. They do not, indeed, tend to the elucidation of any particular subject, but they may nevertheless be of equal advantage, if they should have the least effect to the intended purpose.

Agriculture is the most important and useful of all the arts, which have employed the attention of mankind. It is the means of furnishing, as well almost all the luxuries, as the necessaries of life. The improvement of it not only tends to our ease and pleasure, but provides a defence against those dreadful calamities of scarcity, famine, and consequential disease, to which, by the accidents

accidents of season, we are naturally liable. As an art, it is worthy of study in the highest degree, not only from its momentous consequences, but from its engaging the mind in extensive pursuits of general knowledge. Since it is dependant in some measure on several of the most considerable branches of science; especially natural history, chemistry, experimental philosophy, and mechanics; from the application of all which branches of science, it may be advanced in many points; and, without the aid of which, the theoretic principles of it cannot be well understood. But, with respect to the practice itself, very considerable improvements may be made by experiments, and observations on particulars, without any theory. So that those, who are not at all versed in the more abstracted parts of knowledge, ought not to be deterred from the attempting such improvements.

But besides the general advantages, which render agriculture so important to all countries, there are others, that constitute it peculiarly interesting to our own. The good we receive from it does not consist only in providing copiously what we want for our own consumption and use, but in its affording likewise some very considerable articles of commerce, that conduce greatly towards determining the balance of trade in our favour. The quantity of corn, and malt spirits, we export, are objects of great account, and contribute to make the advancement of this art extremely essential to us. For, the production and exportation of these commodities are a more stable and certain benefit even than manufactures, which, in the present state of Europe, are subject to fluctuate and migrate: while the advantages of soil, season, ports, correspondence, subservient arts, &c. secure us much more from rivalry in that part of our trade, which depends on our natural produce. The flourishing state of our manufactures themselves, moreover, are greatly dependant on that of agriculture. Not only the price of commodities obtained by labour is strictly connected with that of the necessaries of life; but the materials of some of the most

considerable articles of manufacture are furnished by means of agriculture; as wool, flax, hemp, rapeseed, tallow, &c. The improvements therefore of agriculture, by rendering them cheaper, enable the manufacturers to abate the price of the respective manufactured articles in proportion; and consequently give equivalent advantages with relation to the demand in foreign markets.

An art so beneficial to mankind in general, and so peculiarly profitable to our own country, as agriculture, is consequently deserving our most earnest care and encouragement; as well with relation to the promoting the discovery of those manifold improvements it yet admits of; as the extending the knowledge and more general practice of such as are already brought to light. Both these views present so interesting an object, we can scarcely doubt, that any who have the power to advance them, without material inconvenience to themselves, would neglect it. Yet it is obvious by the effect, that this power is by no means so frequently exercised as it might be; as we see there are many places where the modern improvements have not hitherto gained even the least footing. It must be ascribed, therefore, to an inadvertance to, or ignorance of such power, that we find this supineness in the use of it: since the private advantage to many, who are passive in this matter, by the increased value of their estates, would not be less than that which would accrue to the public from a due attention to it. To point out the manner, therefore, by which a great number of gentlemen and others may promote the improvement of agriculture with very little expence, and trouble, seems to be one effectual means of procuring it to be done; and I have therefore here endeavoured by the following observations to throw a just light on this subject. But as they would not be intelligible without a more general consideration of the means, by which the improvement of agriculture may be brought about, I must intermix some general reflections on that head.

The advancement of agriculture, as above hinted, depends on two principles. The one is, the improvement
of

of it as an art, by discovery or invention : the other is, the enforcing the more extensive practice of such improvements when brought to light and demonstrated. The latter of these not only relates to future improvements, but also to many already made : some of which are wholly neglected hitherto ; others adopted only in particular places ; and none scarcely practised in general.

The improvement of agriculture as an art by invention offers two different objects. The first, the producing more perfect machines and instruments for performing the several operations with greater ease and advantage : the other, the finding new articles of profitable culture : or more expedite and gainful means of treating those which are already received. Neither of these does in general require particular talents in those, who would attempt them with success. The improvement of the instruments may, indeed, in some cases, be aided by a knowledge of mechanics ; and the other, especially, as to the introduction of new articles, by the natural and commercial history of plants. But, as most of the instruments of husbandry are of a simple construction and use, natural sagacity and observation alone may frequently suggest very material improvements in them, without any theoretic knowledge. The same holds good equally with respect to the finding out more expedite and profitable methods of treatment, as to subjects of culture already in use. For, trials and comparative examinations, made with care and good sense, cannot fail to clear up many particulars at present very obscure and doubtful. Any ingenious person may, therefore, attempt the improvement of agriculture with great prospect of success : and even those, who have no extraordinary acuteness of genius, may by plain trials, attentively made, decide many points of great consequence to be understood. The natural capacity requisite for lending some aid towards the rendering this art more perfect, seems to be almost general. Nothing is wanting, therefore ; but situation as to opportunity, ability with respect to expence, and sufficient motives for application.

The

The improvements, that depend on invention or experiments of a speculative nature, can, nevertheless, be expected, for the most part, only from gentlemen, or persons of a liberal turn of mind. As both spirit and fortune are, in some degree, wanting to undertake matters, where the event is dubious, and may produce an actual loss. But, with respect to these requisites, we are particularly happy at present; there being great numbers of gentlemen, who possess a taste for agriculture: and the society of London, has no small part in increasing them: assisted, I am satisfied, likewise by your work. In this point, therefore, of the improvement of agriculture, by invention, we have gained much of late; and have the prospect of still more. But, the establishment, in general practice, of such improvements, is not, I am afraid, correspondently advanced; though, without it, the other is rendered fruitless and of no account. It is this, therefore, that more particularly calls for our attention; as the obstacles to it are strong and general: and, the attempt to surmount them requires particular management and address.

The means of introducing into general use improvements of agriculture, when discovered, consists in two particulars; the due communication of them to the public: and an adequate incitement to put them in practice.

The due communication of any matters of this kind can be only, by proper publication of some work, where they may from time to time find a place: and those, who are desirous of them, may know how to come at them. This is not the case of insertions made casually in journals, or other detached pieces, which, from their number, render it impracticable for any individual to examine more than a small part of them. The society of London, from some unlucky circumstances, have greatly failed in this point, of being so useful to the public as they might have been. For, from the want of the publication of their historical register, as proposed in their book of laws, or of some other such piece, they have buried in their own manuscripts every thing which has been transmitted to them: and prevented,
also,

also, by that discouraging means, much more from being sent to them. In this point however, your work has supplied, in a considerable manner, what they have neglected : and greatly contributed to assist them in the introduction of many particulars : as appears in the case of the Hainault scythe, lucern, burnet, &c.

While you support your work, the means of communication of improvements of agriculture to the world will not be deficient ; especially if all those, who seek the sanction of the society, knew there was so proper a channel for conveying afterwards, the fruits of their labour to the public.

The inciting particulars, to put in use the improvements, is the last, and indeed an indispensable means of advancing agriculture. For, without them, all such improvements are only amusing speculations.

But, here lies the greatest difficulty, and the reason, why, in spite of all the study and endeavours that have been applied, we yet find, as to many particulars, the practice in its ancient and crude state, in most places that are not very near to London. This difficulty consists mostly in one simple principle : the repugnance, which people in a lower station have, to quit the way they are used to follow : and to adopt new notions or methods. The degree of this, in fact, is almost beyond credibility. For it is not confined to such as may lose by trials, and therefore fear to risk them : but extends even to those, who acting as servants, might gain favour by their compliance without the least chance of losing any thing. In vain, nevertheless, frequently, is every endeavour to overcome the attachment to old methods ; and I know several gentlemen, who, after having procured instruments of the simplest operation, and most certain advantage, have been obliged to lay them aside, on account of a total want of power to make their own servants use them. The society of London, have very judiciously, and spiritedly exerted themselves, with respect to the introduction of new articles of culture : which was the only matter of this kind they could interfere in. But it
rests

rests principally on private Gentlemen, to surmount this impediment, by a due perseverance in example, and encouragement. There is, indeed, besides the benefit arising to the public, a strong motive of private interest, if duly considered, in the case of gentlemen, who have estates in places where the culture is unimproved. For, in proportion, as greater advantages can be made of the land, the farmer will be able to submit to an advance of rent; as we see in the countries, where considerable improvements have already taken place.

The first method, by which gentlemen may influence farmers to adopt improvements, is, by setting them the example, in the effectual practice of such improvements in their own lands, with perseverance for a considerable time. This, by degrees, removes the prejudice. For, as the novelty of the notion goes off, their own prepossession on that score diminishes: and they begin to open their eyes to the advantage. But, if sets of gentlemen in each neighbourhood, or even particulars who can afford it, were to join small premiums or rewards to be dispensed to those, who within appointed districts should first, or best perform proposed improvements, it would greatly aid the example, and call the attention of all that are near, to the matter desired. The society of London, do all, that seems in their power, of this kind. But the knowledge of their premiums does not reach common farmers; and the prospect of gaining them seems too faint and remote to affect them materially, which, promises made and performed under their own eyes, undoubtedly might. It would, therefore, be extremely serviceable to the cause of agriculture, if county, or neighbourhood societies, were established over the whole country, who would promote experiments of further improvements, or encourage the practice of such as are already known. There is one of this kind; which has been some time established in Brecknockshire, with great success, as I am informed: and I have heard of some others, but with less certainty. It were to be wished, that the particular transactions of all of them, with relation to their plan, ob-

I
jects

jects of premium, experiments, and result of their proceedings, were communicated to you, in order to your digesting, and inserting them in your work. The doing this, would not only furnish an example that might incite others; but would afford a guide for their better manner of institution. If such societies were formed, over and above the benefit they would produce by the enforcing the establishment of discovered improvements in their neighbourhood, they might easily procure trials to be made of particular methods under their own inspection; as has been done by that of Dublin: and if the result of such trials, was duly communicated to you, as well the invention of improvements, as the introduction of them into practice, would be more effectually promoted, than by any other means whatever. It is alone, by a due regard in gentlemen for agriculture, exerted with spirit, that it can be advanced to a more perfect state: and there are scarcely any that reside in the country, but who have it in their power to do somewhat towards it, by their example, influence, or pecuniary assistance. If, therefore, that attention to, and zeal for it, which we find now prevailing in numbers, should become general, we hope to see many of the counties, which, though capable of great fertility, wear now, through the barbarism of practice, and neglect of due culture, the face of poor and unkindly land, rivalling those in the neighbourhood of London, which, without any advantage, but what is owing to art and diligence, appear as gardens compared with the others.

If these general observations, seem deserving of a place in your next number, you will indulge them with it accordingly. When you hear from me again, it shall be on particular subjects: as I have, by me, a collection of important articles, as well with regard to matters that have come before the London society, which I constantly attend, as others. In the mean time I am,

GENTLEMEN,

Your very humble servant,

AGRICOLA.

NUMBER LI.

A Letter from the Rev. Mr. Comber, to the Editors, including also another from him to J. Cooke, Esq; both containing an Account of some Experiments, which seem unfavourable to the Opinion, that the Culture of Burnet may be useful and profitable.

GENTLEMEN,

IN all my addresses to you, I have made it my study, to state all circumstances on both sides of every question fairly, to the very utmost of my power; that the public and myself might be able to form a right judgment on every question of importance to improvements in agriculture. In particular, on the subject of burnet, I have laid together every thing which occurred, seeming worthy of notice towards the ascertaining the nature and culture of this plant; which, I have hitherto hoped, would become a considerable acquisition to the improvement of ground. Some late experiments, gentlemen, however seem unfavourable, very unfavourable to these hopes. I have, therefore, with my constant impartiality, laid them before the public, by the channel of your *Museum*, in a copy of my answer to a card from *J. Cooke, Esq; of Garton*, on our northern wolds. That gentleman's integrity is above suspicion; and therefore the fact he asserts, cannot be disputed by any reasonable man. I will not suppose myself to stand less favourably in the opinion of the public and of you than *Mr. Cooke* stands in mine; because, I know my conduct has given no room for suspicion, but the contrary. However, you will see that I excuse myself for not joining immediately in *Mr. Cooke's* conclusion, viz. that "the recommendation of the culture of burnet is a great imposition on the public." I hope, gentlemen, from you, or your candid correspondents, such judgments on these facts, which *Mr. Cooke* and I vouch
on

on our credit, as may enable us to determine what we ought to think on this subject. In the mean time, gentlemen, to shew you that I do not give up the subject of my late inquiry, I yesterday dug up from the downs I mentioned, several roots of that burnet to which you have given my name, and intend to plant and cultivate them in a better soil, to see what the effect will be. I must, however, observe, 1st, that as this species of burnet grows in a *sandy* and *gravelly* soil, it is in a manner impossible to get up the plants with any considerable length of root, as the root shoots itself, in all oblique directions, amongst the pebbles, and by this means is cut at the length of an inch or an inch and a half from the surface. We shall see whether these shortened roots will send forth lateral ones and grow. 2dly, That this species of burnet appears, as I conjectured, to be liked by sheep very much; for these animals, having been watched on this ground since I wrote my last, have not left one single head of this burnet, (so that the hope of gaining any feed this year is at an end) and have eat down the leaf close to this ground, just as they eat down the finest species of the trefoils. 3dly, Though the situation whence I gathered this burnet is very high, and the soil very sandy, and the drought has been intense, yet the plants are in the fullest verdure and vigour. 4thly, The soil whence I gathered these plants, has been pared about two years ago, for turf for walks; and yet these burnet plants, which must have had not only the heads, but a part, and a considerable one, of their roots cut off, appear as *original plants*, though really only shoots from the remaining roots. This is a very remarkable circumstance!

Your correspondent, the *Kentishman*, gentlemen, seems to think that the continuance of his burnet feed in the ground 23 days before it sprung, is to be ascribed to the land's being *cold by the wheat*, and the late sowing of the feed. But I can think no such thing. For I sowed my feed in the end of *April*, a very kindly season for springing, and on a piece of garden-ground, which seemed

most adapted to burnet; and yet it continued in the ground without springing, as long, or longer, though I did not justly mark the time. I have sown more burnet once or twice since, in much warmer weather; and yet it has been as long, I dare say, as the *Kentishman* mentions, and was sown on a still better soil. This seed having an hard husk, seems to require considerable time, in every soil, to burst forth. One thing, gentlemen, I have to add, in regard to my lately-found burnet. I have said, in one of my letters to you, that "the heads exactly resemble Mr. *Rocque's* in miniature." Now when I look on the representations in your plate, the head of my burnet appears as large as that of Mr. *Rocque's*; and, I believe, the fault is in my expression, and not in your engraver. If this be the case, it is a recommendation of my burnet; for in proportion to the size of the head, probably is the seed; and the strength is supposed to be in the seed.

Whoever looks at figure 2 and 3 in your plate, would think them different species; and yet figure 2 is a delineation of the burnet, which Mr. *Lancaster* sent me, and which certainly sprung from Mr. *Rocque's* seed; and I suppose figure 3 is as certainly what springs from the same gentleman's seed. There are, however, leaves among Mr. *Lancaster's*, which approach much nearer to figure 3 than figure 2 does; but the burnet which springs from Mr. *Cooke's* seed, originally *Rocque's*, is more like figure 2 than figure 3 in general. And *Civicus* owns, that he has found some plants, with a rounder leaf and smaller indentures. Is the burnet which your correspondents say, all the cattle like, of this longer species? That which my cattle dislike, is generally of the rounder.

I am, GENTLEMEN,

Your faithful and impartial correspondent,

East-Newton,
Sept. 18, 1765.

T. COMBER.

P. S. It

P. S. It is merely an act of justice to the public and you, gentlemen, to own, that I am at full accord with all your remarks at the end of your publication for *July* last. Nothing can be more reasonable, than your account of the plan on which you set out, and to which you have religiously adhered. Perhaps I, and every reader you have, may meet with somewhat in every one of your publications, which we think we ourselves could do *very well without*. But "*Chacun à son goût*," say the *French*, and with great reason. Nothing can be more masterly than your answer to the first Letter-writer. He complains of your admitting somewhat of *theory*: just like the *old-fashioned farmer* and his brethren, whose mistakes on this subject I had *rectified*. You tell him, that his own letters have, by *many* of your correspondents, been condemned as *nothing but useless theory*. This must stop his mouth, if any thing can stop the mouth of a *partial caviller*.

A Letter to J. Cooke, Esq; of Garton, near Malton, Yorkshire, so far as regards Agriculture.

S I R,

I AM much obliged to you for your very civil invitation of me to spend some days at *Garton*, where I should not only have had the opportunity you mention of seeing to advantage the several operations of reaping in one of the best corn towns on the wolds, but the additional one of paying in person my thanks to you for a former civility in sending me *burnet-seed*, &c. Just when I received the favour of yours, I was setting out on a visit, &c. and returned hither about a week ago; but hope to have some future opportunity of accepting your kind invitation.

I cannot say, Sir, that I was *surprized*, though I was *sorry*, to read the account you give of burnet. I had formed to myself very sanguine notions of the usefulness of this grass, and regarded it as one of our most important late

improvements. But a very little time before I received, Sir, the favour of your card, I had made some experiments which surprized me much, and agree so well with your's, that I must briefly relate them. I took a handful of my young burnet sprung from your seed sown in *April* last, and offered it to a sick foal, whose dam had got, by some means, a surfeit, and communicated the effects of it, in her milk, to the foal: I was in hopes that this young grass would have purified its blood, as Mr. *Rocque* speaks so much in its praise, for curing the grease and other maladies ensuing thence, as leanness in horses. But I was surprized, Sir, to find, that the foal, having tasted it once or twice, would eat no more of it *alone*; and though it eat a little more, mixed with lucerne, of which, unmixed, it was very fond; yet it soon, very soon, tired of this food, and would eat no more lucerne, mixed even with a very small quantity of the burnet; its smell enabling it to distinguish and decline the rankness of the latter, even amid the great fragrance of the former. I then thought, Sir, that the burnet might be too strong a food for a sick foal, a few months old, and offered a handful of the newly-gathered burnet to the mare, the dam of my foal, and separated from it. She smelled to, but would not taste the burnet at * all. I was much surprized, Sir, but apprehended that this dislike might be something peculiar to my mare and foal, as I thought it not unreasonable to suppose, that *brutes*, as well as *men*, may have their particular dislikes to food greatly liked by the species. I offered then my burnet, Sir, to a filly turned of two years. She tasted it twice, but could not be induced to meddle with it again. I then offered it to an old horse, which has a custom, when he is displeased with any person, of shooting back his ears, and running after the offender. He approached me with much good humour, smelled to, and tasted my burnet once; but on my offering it again, shot back his ears, and run upon me with fury. I then offered it to all my cows

* *Note*, This mare is of high blood. May we ascribe her greater delicacy to this circumstance?

but one, and they all refused it. I concluded that my old cow, which had been bought of a poor person, and used to eat all kinds of weeds, would eat the burnet. But herein also I was mistaken: for she smelled to, but would not taste it.

As I had read, Sir, several assertions in the *Museum Rusticum*, that cattle of *all* sorts are very fond of burnet, I was much surprised to find the direct contrary to be fact with me, and applied myself to investigate the cause of a *phenomenon* so opposite to what I had *reasonably* expected, and fancied that it arose from some peculiarity of my soil, or the water with which the bed had been sprinkled. But, on the most accurate examination, I found that there was nothing either in the *natural soil*, the *manure* with which it had been dressed, or the *water* with which the burnet had been refreshed, which could account for the cattle's dislike; since the adjoining ground, of exactly the same soil, and treated in exactly the same manner, produces lucerne, of which all my horses and cows are exceedingly fond. Your card, Sir, convinces me, that the *cause* of dislike is in the *plant itself*. You assure me, Sir, that none of your cattle like it any more in *hay* than in *green fodder*. This, Sir, I can easily believe: for if the juices do not recommend a grass, I cannot think that when dried it will be more agreeable.

You conclude, Sir, from your disappointment, that "the *recommendation of burnet is a gross imposition* on the public." I must own, that your conclusion seems not unreasonable; and yet you will excuse me, if I do not acquiesce in it *immediately*.

I cannot tell how to persuade myself, that the several writers in the *Museum Rusticum*, who assert, on their own knowledge, that *all* sorts of cattle are very fond of burnet, can either be *mistaken*, or combine *wilfully to deceive us*. Some, or most, of these writers, indeed, conceal their real names; and therefore great stress, as to facts, cannot be laid upon their assertions. But some others sign their *real names*, or, at least, suffer them, I suppose, to be published;

published; as Dr. *Lamb*: and, no doubt, people, to whom you and I are not *personally* known, will pay *as little*, or *less*, regard to our assertions, that our cattle do not like *burnet*, than to the assertions of *greater numbers*, that theirs do like it.

I propose to lay my own experiments and your's before the public, by the channel of the *Museum Rusticum*; and we shall then see, what *authentic certificates of cattle's liking burnet* can be produced. If such be produced in a sufficiently considerable number to make it appear, that burnet is a grass *generally* liked by *all* sorts of cattle, we must only conclude, Sir, that there is something *peculiar* in our soil, or the palates of our cattle, which renders it an improper fodder for us.

In the mean time, Sir, I must own, that I am surprised by your declaration, that you can convince me that your *common wild burnet* keeps green *all* the winter. It certainly does not in this neighbourhood, as Mr. *Lancaster* justly observed to me, and I have since remarked.

You will see, Sir, in Plate I. Vol. V. of the *Museum Rusticum*, Fig. 6. a good delineation of our common wild burnet; and in Fig. 7. as good an one of another species, to which the editors have given my name. I wish, Sir, you would be so obliging as to inform me whether your common wild burnet agrees with the one delineation or the other; or, if it agrees with neither, that you would send me a specimen. Please also to inform me, how the several species of cattle like your common wild burnet, and whether sheep dislike Mr. *Rocque's*. I have only, Sir, to add, that I apprehend, even swine, which eat almost all species of grass, dislike Mr. *Rocque's* burnet; for mine having broken the inclosure, do not appear to have meddled with the burnet.

I am, Sir,

Your obliged, humble servant,

East-Newton,

September 17, 1765.

THOMAS COMBER.

P. S. A

P. S. A great objection to the culture of burnet seems to arise from its slow growth in comparison with many other grasses. The burnet sprung from your seed, on a soil allowed to be much properer for it than lucerne, is now only about five inches high at the utmost, and has scarce one head in flower; while lucerne, on the same soil, sown the same day, and much thicker, is about eighteen or twenty inches high.

N U M B E R LII.

An Account of several very important Experiment made by Mr. John-Wynn Baker, under the Direction of the Dublin Society, and published at their Request, on the Culture of Cabbages, the Turnep-Cabbage, Boorcole, and Turneps, by various Methods; with an accurate State of the Produce; and of the absolute and comparative Advantages of each in feeding Sheep and horned Cattle.*

IN the month of March, 1763, two acres of ground, very highly manured with dung, were planted with potatoes, in the manner usually practised in this kingdom, with spade and shovel; in the beginning of November following

* We hope the inserting these experiments and observations, will not be looked upon as a deviation from our plan, of exhibiting in general, only such pieces as are of an original nature. It is true, what we here present has been before printed in Ireland, but was never published in this country; nor in any manner, that could put it in the way of English readers, unless by extraordinary means. This, and the consideration of the value of the matter itself, cannot fail to render it acceptable, and yield an ample justification for the use we have made of it.

Mr. Baker made these experiments at the recommendation of the DUBLIN SOCIETY, who voted him one hundred pounds "to defray his expence; and as a recompence for the trouble he should be at." They have since, on his report, desired him to print it; and voted him the further sum of two hundred pounds, to enable him to proceed on other similar pursuits. In Mr. Baker's





published; as Dr. *Lamb*: and, no doubt, people, to whom you and I are not *personally* known, will pay *as little*, or *less*, regard to our assertions, that our cattle do not like *burnet*, than to the assertions of *greater numbers*, that theirs do like it.

I propose to lay my own experiments and your's before the public, by the channel of the *Museum Rusticum*; and we shall then see, what *authentic certificates of cattle's liking burnet* can be produced. If such be produced in a sufficiently considerable number to make it appear, that burnet is a grass *generally* liked by *all* sorts of cattle, we must only conclude, Sir, that there is something *peculiar* in our soil, or the palates of our cattle, which renders it an improper fodder for us.

In the mean time, Sir, I must own, that I am surprised by your declaration, that you can convince me that your *common wild burnet* keeps green *all* the winter. It certainly does not in this neighbourhood, as Mr. *Lancaster* justly observed to me, and I have since remarked.

You will see, Sir, in Plate I. Vol. V. of the *Museum Rusticum*, Fig. 6. a good delineation of our common wild burnet; and in Fig. 7. as good an one of another species, to which the editors have given my name. I wish, Sir, you would be so obliging as to inform me whether your common wild burnet agrees with the one delineation or the other; or, if it agrees with neither, that you would send me a specimen. Please also to inform me, how the several species of cattle like your common wild burnet, and whether sheep dislike Mr. *Rocque's*. I have only, Sir, to add, that I apprehend, even swine, which eat almost all species of grass, dislike Mr. *Rocque's* burnet; for mine having broken the inclosure, do not appear to have meddled with the burnet.

I am, SIR,

Your obliged, humble servant,

East-Newton,

September 17, 1765.

THOMAS COMBER.

P. S. A

P. S. A great objection to the culture of burnet seems to arise from its slow growth in comparison with many other grasses. The burnet sprung from your seed, on a soil allowed to be much properer for it than lucerne, is now only about five inches high at the utmost, and has scarce one head in flower; while lucerne, on the same soil, sown the same day, and much thicker, is about eighteen or twenty inches high.

N U M B E R LII.

An Account of several very important Experiment made by Mr. John-Wynn Baker, under the Direction of the Dublin Society, and published at their Request, on the Culture of Cabbages, the Turnep-Cabbage, Boorcole, and Turneps, by various Methods; with an accurate State of the Produce; and of the absolute and comparative Advantages of each in feeding Sheep and horned Cattle.*

IN the month of March, 1763, two acres of ground, very highly manured with dung, were planted with potatoes, in the manner usually practised in this kingdom, with spade and shovel; in the beginning of November following

* We hope the inserting these experiments and observations, will not be looked upon as a deviation from our plan, of exhibiting in general, only such pieces as are of an original nature. It is true, what we here present has been before printed in Ireland, but was never published in this country; nor in any manner, that could put it in the way of English readers, unless by extraordinary means. This, and the consideration of the value of the matter itself, cannot fail to render it acceptable, and yield an ample justification for the use we have made of it.

Mr. Baker made these experiments at the recommendation of the DUBLIN SOCIETY, who voted him one hundred pounds "to defray his expence; and as a recompence for the trouble he should be at." They have since, on his report, desired him to print it; and voted him the further sum of two hundred pounds, to enable him to proceed on other similar pursuits. In Mr. Baker's

following the potatoes were dug. The land being *low*, and the winter very wet, it could not be plowed until the beginning of March, 1764; when, it should be observed, the under *stratum*, upon which the dung and potatoes lay, rose at the plowing as stubborn and strong, as if no part of the ground had been tilled before: which proves the potatoe tillage, in the manner in which it is usually practised, not to be so beneficial to land as is generally imagined: the fact being, that only about thirty inches in every nine feet of the ground is tilled at all †.

reports, along with these we now insert, are accounts of other experiments; with correspondent observations, made by him, on spring and common wheat, burnet, lucerne, red clover, and other subjects; which we shall give in our next publication. To these, Mr. Baker has subjoined some letters that he formerly published in our work; which he says he has introduced at the request of several members of the Dublin Society. One of these letters is on the culture of lucerne; the rest on the cure of cattle that are violently swoln with eating red clover. The particular reason for giving them a place, he himself thus explains in his preface. "The papers which I have introduced relative to the cure of "black cattle swelled by eating clover, will, I hope, be of that "service to the public which I intended, by originally setting the "enquiry on foot; which opportunity was afforded me, by the "*Museum Rusticum*: a work which puts it in every man's power "to communicate his discoveries to the public, without the disagreeable business of attending the press; and the many answers with which gentlemen favoured my enquiry, shews the "utility of that undertaking." We are extremely obliged to Mr. Baker, for the genteel mention, he here makes, of the *Museum Rusticum*; and hope it will answer his good intention of serving the public, by inducing other gentlemen, under parallel difficulties, to pursue the same means for obtaining the information they may want. O.

† The dung for potatoes is generally laid in beds of six feet and a half, or, at most, seven feet, width, upon the surface of the ground, without any preceding preparation; upon this dung and solid ground are the seed potatoes laid, and then a deep trench, of about thirty inches width, is dug, in order to cover the ridge where the dung and seed are first laid. This is an injudicious practice; the dung too often draining into the trenches; and, when the potatoes are dug, the pulverized earth is returned into the trench. The land should at least be once ploughed, before the dung is laid on. But there are still better methods practised in some places, of which I shall give an account at some future day.

In

In the night of the 10th, and on the 11th and 12th, of May following, there was very fine rain; this rain enabled me, on the 12th, to reduce this stubborn ground pretty fine by the harrow.

In the month of March, 1763, the other part of this field was broke for fallow (an improper time to break fallows; but, my entrance upon the farm in that month was the cause); in June following it was cross-ploughed, which brought it into very large lumps; from the position this ploughing threw them into, they were exposed, in a greater number of points, to the influence of the weather, than the ground would have been, had the second ploughing been in the same direction as the first.

In this situation I left this fallow till the March following; when, it was ploughed for the third time, with the potatoe ground, in the same direction as at first; by this third ploughing this land was brought into an exceeding fine tilth.

This benefit arose from the ground not having been harrowed at all. This is something contrary to the common mode of culture; but was adapted to the species of ground I had to work upon; which I shall describe hereafter.

What the harrow would have done in part towards reducing it after the second ploughing, was completely effected by the influence of the summer and winter; the first destroyed all the weeds and couch-grass (with the latter of which the ground abounded); and the lumps exfoliating by the operation of the winter, by degrees fell into fine mold; whereas, had it been harrowed before the winter, the rains would have run the smaller particles together, so as to have given a great adhesion to the ground before the spring; abstracted from the like mischief, which the cattle would have done by drawing the harrow. In the beginning of June, I ploughed this part of the field a fourth time, and the potatoe ground a second; by which ploughing I laid the whole field into ridges of five feet width, except about half an acre, which I reserved for other purposes, as will appear hereafter.

In this field I had two parcels of manure ready prepared for it. One consisted of earth raised from the head-land, mixed with lime, which lay about twelve months, having been in that time twice turned.

The other parcel consisted of the like earth, and lime, mixed in the same manner, after which I mixed dung with it, *stratum super stratum*, which lay about two months, when I turned it: after which it lay about two months longer: by this stirring the ingredients, of which this parcel was composed, were perfectly incorporated with each other; and a new putrefactive fermentation was excited in it; which perfectly prepared it for the land: and all the earth was so fully impregnated with the juices of the dung, that it was very little, if any thing, inferior to the dung: whereas, when dung lies by itself, great part of the volatile saline particles are lost, as soon as the fermentation begins; some fly off in vapours, and others run off with the juices of the dung and rain, which fall upon it.

When I have mixed dung and earth, in the manner already described, I always once, or twice when the season affords it, cover the compost with a large quantity of snow, or ice; which, upon dissolving in its passage through the whole, causes the earth to be finely impregnated by the dung. Snow, by being gathered with shovels, or rolled together in balls, is longer dissolving than ice, and therefore I prefer it, unless it be ice of water which happens to be the soakage of a dung-yard, such ice being always replete with food for vegetables.

The land being now, in June, in five feet ridges, in the manner already described, I began to draw out my compost; which I disposed in the following manner: I drove the cars up every alternate ridge, and upon each of them dropped the compost, till I had manured about three acres of the fallow ground; then, with shovels, I divided this manure, as equally as could be, in every furrow; which was readily done, from the convenient manner in which it was deposited.

In the same manner I put out the other parcel of manure (which, it may be remembered, I before said consisted of
lime,

lime, and earth) upon an acre and a half of the potatoe ground; and on a part of the fallow ground, where no compost, or other manure, had been put; and spread it in the same manner as the former.

The whole field being thus manured, I ploughed it again, which was the fifth ploughing of the fallow, and third of the potatoe ground: by this ploughing I altered the position of every ridge, by laying the middle of each exactly over the manure; consequently the furrows were made, where the middle of the ridges was before.

The half acre before mentioned I manured with at least double the proportion of compost, which was allowed to the other part of the fallow; as it was flat, and it was necessary to manure every part of it, being intended for turneps, to be sown in the promiscuous way.

To this piece of ground I gave a sixth ploughing; as it could not have the benefit of the horse-hoe, when cropped, and therefore I thought it necessary to reduce it as fine as possible, in order to give the broad-cast crop of turneps every advantage I could.

The field being prepared in the manner already described, I proceeded to crop the land in the following order.

July the sixth and seventh, I planted one row of cabbage plants, upon the middle of every ridge, of about an acre of the fallow ground, the plants in the rows two feet from each other. In like manner I planted about half an acre with turnep-cabbage plants.

Hence it may be observed, that the plants were in rows five feet asunder, and two feet asunder in the rows.

This business ought to have been done, at least, a month sooner; but I could not get the ground ready in due time; however, the success of these crops may encourage others not to give up their expectations, although they may happen to be as late as I was, which must frequently happen in a course of business; though this is always to be avoided as much as possible.

I never begin to put my plants out till about six o'clock in an evening, unless I can be ready for planting in a rainy

rainy day, which is always to be preferred; in the other case, I always keep the men at this work as long as they can see. If it can be done in, or immediately after, rain, that will save the expence of watering the plants; which is an object worthy of attention in a large work of this kind; besides the circumstance of the plants succeeding much better.

On Friday the sixth of July we had fine rain, and on the seventh I finished. On the eleventh we had some light showers, and on the twelfth fine rain, which secured life to my plants; but they began to look sickly before the twelfth; three of the intervening days having been hot and dry.

On the seventh I also planted three of the five-foot ridges, with one row of boorcole plants on each ridge, the plants in the rows two feet asunder.

Be it observed, that, for the obtaining large cabbages of the spring sowing, the seed ought to be sown early in March; and, if once planted out before the final planting them, it will be an advantage to the crop: the case is the same with respect to turnep-cabbage; but it is more essentially necessary in the common way of raising cabbages; for, otherwise, they will run into long shanks, and will not cabbage well; most gardeners allowing their plants too little room: that is not the case here; my cabbage and turnep-cabbage seeds were not sown till the twenty-sixth of March, and I was so much hurried, that I never had time to get them planted out before the final planting, save about three thousand plants; and yet they are all very short in their shanks. This may justly be attributed to the manner of disposing them, and the culture they receive in this husbandry.

Here I cannot omit to remark one circumstance, for the observation of gentlemen and farmers who may adopt this husbandry, *viz.* That I have not one cabbage this year of the sort I intended to have; what I have being chiefly sugar-loaf, the seedsman having deceived me; and, if I had not happened to have about an ounce of turnep-cabbage seed by me four years old, I should not have had

one

one plant of that kind this year; the seed, which I bought in Dublin for it, turning out a poor, small, wretched cabbage.

I shall now proceed to make my report of the farther treatment, and success, of these crops, before I proceed to the turneps, &c.

Upon the 17th of August, I horse-hoed my cabbage, turnep-cabbage, and boorcole, for the first time, by taking off, at one furrow of the plough, only one side of each ridge, close to the plants: thus they remained till the 25th, when, I ran the plough in the same furrow; by which, with the first furrow, I plowed about twenty-one inches deep. This being finished, I immediately returned the earth back to the plants; this afforded them fresh nourishment; and, in order to give their roots time to penetrate this fresh earth, which, by the horse-hoeing, was become very fine mold, I let them remain in this state till the 12th of September; when, I horse-hoed them again, by taking off the other side of every ridge; and, on the 20th, deepened the furrow in the same manner as the former, and immediately returned the mold back to the plants; and, on the 18th of October, threw up a small furrow to each side of every ridge, which finished the culture of these crops, and restored the ridges to the form in which they were when the plants were put out upon them.

The plants all grew very luxuriantly; and, in the hottest weather, were infinitely more brittle in their leaves, than any I could see in the gardens of my acquaintances; which is a certain indication of health in this kind of plants.

The horse-hoeing was so effectually destructive to weeds, that it cost me but four-pence to weed these crops, which occupied about an acre and three quarters of ground.

The repeated horse-hoeings cost me two shillings and four-pence an acre, for workmen's wages, exclusive of horses, of which I used two, and sometimes three*.

* In horse-hoeing, the horses are always yoked one before the other, as in a cart.

December

December the 8th, I cut one row of the cabbages, they beginning to decay, which is indicated by their bursting. The number was two hundred and fifty-eight, and they weighed sixteen hundred-weight, three-quarters, and twenty-one pounds, *i. e.* one thousand eight hundred and ninety-seven pounds: which, at an average, is seven pounds and near six ounces for each cabbage.

The produce upon an acre, on weighing this row, which was five hundred and sixteen feet long, amounted to twenty-three tons, four hundred, two quarters, and fourteen pounds, *i. e.* fifty-two thousand and thirty-eight pounds: which is, at least, from ten to seventeen tons less, as I compute, than the produce would have been upon an acre, had I obtained the sort I intended to have, which was the large, late, Dutch cabbage. However, such a produce as was here obtained, will be an ample reward for the labour any one may bestow in this husbandry, as will appear when I shall come presently to shew how many cattle twenty-three tons will maintain.

December the 17th, I took up one row of the turnep-cabbages, which were in number two hundred and forty-nine, they weighed eighteen hundred weight, and fifteen pounds, *i. e.* two thousand and thirty-one pounds, after chopping off the roots and stalks below the turnep, which ought not to be weighed, as being no part of the food for sheep, or cattle: the weight of these plants, one with another, was something more than eight pounds and two ounces; some few weighed fourteen and fifteen pounds. The produce upon an acre, on weighing this row, which was four hundred and ninety-eight feet long, amounted, at the same proportion, to twenty-five tons, fifteen hundred, three quarters and seven pounds, *i. e.* fifty-seven thousand seven hundred and sixty-one pounds.

This crop was much greater than ever I had before; and, from some observations I have made this year, I am inclined to believe, their culture may be improved to a produce of ten tons more upon an acre: but, abstracted from that, the produce already obtained is more valuable

than any crop I know of, for they are invincible by the winter, either in or out of the ground. The great distress of even the careful farmer is in the months of March and April, for his ewes and lambs, when turneps are gone, or are but very indifferent food, and all other green winter-food is exhausted.

Feeding ewes upon dry hay affords but little milk to their lambs; add to that, hay is not made without great expence and anxiety, over and above the rent of the land; for really, where the farmer is so unfortunate as to have his hay upon hand in wet weather, it is a business which will exercise his patience, no less than it will consume his money.

One superior excellence in these plants is, that sheep will prefer them to turneps; another is, that they are a firmer and more substantial food: and, to ascertain their firmness in texture, and quality in keeping after being drawn, I have kept them near twelve months exposed to the open air, to the extremes of heat and cold, and, after that, they were sound, save some few.

If any person who may cultivate this plant for sheep, should keep a large flock, he may let the plants remain in the ground till he wants them; in that case, he may turn the sheep into the field, where they will eat them quite down to the stems; and, as the plants stand naturally above the ground, and by my manner of cultivating them, they are still higher, by being placed on the tops of the ridges, the sheep cannot dirty them, as they do turneps, when turned into the crops; add to this, that when the sheep have eaten all the leaves, and begin to eat the butts or turneps of this plant, they will not rot as turneps do, when wounded; but will certainly keep sound, even after that, for six weeks or two months: nay, yesterday, the 15th of February, upon dressing some of them for feed, I found some, which had been accidentally wounded by cows, upwards of three months ago, perfectly sound, notwithstanding the great quantity of rain which had fallen upon them.

When the leaves are wanted early in the winter for sheep, or black cattle, or, the land is wanting for any other crop; in either case the plants may be taken up, the leaves taken off, and the turneps thrown any where upon a piece of sound dry grass ground, where they will keep, and be ready for sheep in the spring: but this work is attended with some trouble and expence, the roots being very firm in the ground.

The latter end of December, and in January, the plants begin to throw out fresh shoots, which are to produce the seed; and, when they begin to do so, all the leaves of the preceding year fall off, being first greatly decayed; and as the leaves, in October and November, are really very numerous, and afford a large quantity of food for cattle, it is well worth the trouble to take them off before they begin to decay; and, when this is judiciously done, the trouble is very little.

The method which I would recommend is, that two men be sent into the field, each taking one row before him, and, as he pulls off the leaves, laying them upon the ridge between the turneps; when these two ridges are finished, or as many as may be thought necessary, let one horse, or more, be brought with a pair of cleeves upon his back; let him be placed in the furrow, between the two rows; and, as he passes along, the two men fill the cleeves, which may be most conveniently done, from such a disposition of the business, without any injury to the turneps in the rows.

Where extensive crops of these plants are raised, it will be very useful to collect all the roots, whether left in the field by sheep, or otherwise separated, and mix them with heaps of earth, where a putrefactive fermentation will shortly commence, by which the earth will be strongly impregnated with volatile and fixed salts, and will then be an excellent manure; and indeed, all succulent vegetables will contribute to the same end, under the like treatment.

I must beg leave in this place just to mention, for the consideration of the society, and which I earnestly recommend

ntend to be tried by mariners, another use, to which, I think, this plant, may be converted, which is still of more importance, than any which I have yet named.

We lose more men in the beginning of a war in the navy, as I have been informed by the navy-surgeons, by the scurvy, than by the enemy, which is attributed to their sudden change of food. From fresh provisions and vegetables on shore, the men are at once brought to salt provisions.

The turnep of this plant, I am inclined to believe, would keep three or four months on ship-board, perhaps longer; but the navy-surgeons have told me, that if it would keep six weeks, it would save the lives of many men. Something has been said on this subject before, in a pamphlet intitled, *Hints on Husbandry*, in a letter to the Dublin society, printed by Flinn, in Castle-Street.

I cannot dismiss this subject, without earnestly recommending the culture of this plant to the attention of the farmer, particularly to such as keep any stock; and, although the plant is very little known, except in the gardens of the curious, yet, whoever will cultivate it in the way I have here set forth, will find himself amply repaid for his labour; for how comfortable is it, for a man's mind to be at ease about his stock, in the months of scarcity? Whereas I have every year observed, that the farmer's stock, particularly ewes and lambs, are turned into his meadows to live upon the springing grass, to the irrecoverable injury of the hay-harvest; as frequently have I seen them upon young clover, to the manifest injury of that crop.

I could enlarge greatly upon these injudicious practices, but in brief I shall only say, that if I shall live to see the culture of this plant generally established, I shall have the comfortable reward of knowing that I have been useful to mankind; a circumstance which will be more grateful to me, than if I had conquered a nabob, or extirpated an Indian nation.

December the 18th, I cut two perches in length of one of the rows of boorcole, which contained twenty-one

plants; they weighed one hundred and eighteen pounds, which is very near five pounds ten ounces for each plant: but I am inclined to believe, that these plants will succeed as well, if they are planted only eighteen inches asunder in the rows. However, at the above proportion, there would be seventeen tons and fourteen hundred upon an acre. But, if the produce would be the same, were the plants only eighteen inches asunder, in that case an acre would produce, by this culture, above twenty-three tons and twelve hundred.

This plant is well worthy the farmers or graziers attention, for, as fast as it is cut, it will again, in about a month or six weeks, afford another crop: I have been cutting these plants for my family-use ever since the middle of August last; I believe some of them have been cut three times; and they are excellent for the table. For feeding cattle and sheep they are highly valuable, as no frost will injure them; and, although the first crop amounts not to as many pounds upon any given quantity of ground as the others, yet the succeeding crops will, I believe, make their produce nearly, or quite, of equal weight with any other of the cabbage kind. But I must not omit to observe, that, as these plants afford only open leaves, and many of them very small, there will be a little more trouble in collecting and carrying them to the sheep and cattle, than there will be with the other kinds.

It may not be improper to observe, likewise, that, upon the approach of the spring, when they begin to throw out their spring-shoots for seed, if the large leaves have not been taken off for winter use, they will decay and fall off in the same manner as the turnep-cabbage leaves have already been described to do.

I have not yet tried it, but I believe that the best way of using this plant, would be to allot one whole field to the culture of it, proportioned in size to the flock intended to consume the produce; and in September or October, to turn the ewes into the field for a few hours, morning and evening, and then lodge them on any piece of grass

or fallow, which may want improvement, to which they will greatly contribute by emptying themselves upon it; and thus continue turning them into the boorcole field, till they have eat all the luxuriant leaves; then let the plants rest a month, and there will be another crop. By having two small fields under this crop, a flock of store-sheep might be maintained a whole winter at a very small expence; for whilst the produce of one field would be consuming, the other would be coming on.

This method occurred to me from an accident, which attended my boorcole this year. My cows got into the field, and presently devoured some of the leaves of the plants; these plants have engaged my attention ever since, and I have the pleasure to see them again in a very luxuriant state.

If any persons should be able to put this scheme in practice before I can accomplish it, I recommend it to them, not to let the sheep pasture so long upon the crop, as to wound the stalks for want of leaves; as too great an injury to the stalks may check the succeeding growth; which injury, I am inclined to believe, will not happen to the plants, at least not in so great a degree, whilst they have a sufficient quantity of leaves.

It doubtless will be observed, that I confine this scheme to ewes or store-sheep: my reason for that is, that fat sheep should always have as much food before them, as they may choose to eat; add to this, that sheep, when they are fat, are more subject to be lame, than store-sheep, to which ploughed ground will greatly contribute.

We shall now return to the state of the field, in which it was after being manured, and ploughed into small ridges of five feet breadth, with the compost under them in the fallow part, and part of the fallow with the lime and earth, and the potatoe ground aided with the lime.

Upon the 14th of July, I sowed with my drill plough what remained of the ridges of the fallow manured with the compost.—That part of the fallow which was manured with the lime and earth—and that part of the potatoe ground which was before described to be in ridges,
with

with turneps : and that part of the fallow before described to be flat, and manured with a double proportion of the compost, I sowed in the promiscuous way with turneps also.

The drilled turneps filled only one row along the middle of each ridge.

When the drilled turneps were about three inches high, I thinned them by hand, as being much preferable, and more expeditious than any instrument, intending to have them singled out to about one foot asunder in the rows : but, it being so new a work, the women could not be brought to do it effectually at once, they apprehending, that the whole crop would be lost, and urging, that they were sure there was already too much ground allowed to one row : under these circumstances, I could not get this work done quite to my mind this year, as I had, besides this field, two others sown in the same way, amounting in all to about twelve acres.

My turneps should have been sown at least three weeks earlier ; but the immoderate, and continual, rains of the preceding winter involved me so much with my spring-sowing, that I could not accomplish my turnep-sowing earlier.

The turneps, after being thinned, received the horse-hoings, much about the same times, and distances, as the cabbages * ; with this difference only, that I deepened the furrows of but a few ridges in another field by a second ploughing in the same furrow, which I did not find to benefit the turneps much : for, if the ground be well prepared before the sowing, the depth of one furrow will be enough for turneps, provided that be deep and bold.

Thinning the turneps in drills by hand cost me eight-pence an acre ; weeding of them cost me four-pence ; and the repeated horse-hoings about fourteen-pence an acre for workmen's wages, exclusive of the horses, of which I generally used two, except in very hot days, and then I found three were necessary.

The broad-cast turneps were carefully thinned by hand, when they were about two inches high ; which

* See page 263.

the women did with more courage than they did the drills; and sometime afterwards, I hand-hoed them once, and wed them twice.

Thinning them by hand cost me four shillings.—Hoeing them afterwards cost eight shillings, and weeding them cost me two shillings and four-pence. They were scarcely half an acre; this expence being therefore doubled, they cost me at the rate of twenty-eight shillings and eight pence an acre, over and above the extraordinary ploughing, and double proportion of manure.

In truth, this crop greatly exceeded my expectations, being by far the best I ever had in the broad-cast way; but I attribute their success wholly to the thinning them by hand; for two, three, four, and often more, turneps will be so united and interwoven, that it would be impossible for the most dextrous hoer to separate them; whereas the fingers and thumb will preserve the master plant, whilst the others are most conveniently drawn from it by the other hand of the person employed: add to this, that there is no labour in which we are more liable to be deceived, than turnep-hoeing.

In one of my other turnep fields I manured about an acre of ground with shell marle, which I sowed in drills with turneps in the same manner as the former, on the sixteenth of July.

In the same field, I manured about half an acre with the native earth, which had been exposed to the weather for upwards of two years, which I sowed likewise in drills with turneps on the sixteenth of July.

Both these crops were thinned by hand, and horse-hoed, in the same manner as the former.

Thus we have five experiments in the drill way upon turneps, with different manure. One with the compost already described—one with lime—one on potatoe ground, aided with lime—one with shell-marle, and one with native earth; and also one in the broad-cast way, with a double proportion of the compost, and an extraordinary ploughing.

The

The principal point to be determined by these experiments is, whether sowing turneps in drills, or the broad-cast way, will afford the heaviest crop: but the trials with the different manures will, I hope, be also useful.

The Produce of Drilled and Broad-Cast Turneps compared.

December the seventeenth, I measured out three square perches of the best of the broad-cast turneps, and also three square perches of the drilled; and the produce was as follows:

The three perches of the broad-cast turneps weighed sixteen hundred weight and one quarter, *i. e.* one thousand eight hundred and twenty pounds; which, at the same proportion, amounts upon an acre to forty-three tons, five hundred weight, three quarters and six pounds, *i. e.* ninety-six thousand nine hundred and seventy pounds.

The three perches of drilled turneps weighed seventeen hundred weight, two quarters, and twenty-one pounds, *i. e.* one thousand nine hundred and eighty-one pounds; which, at the same proportion, amounts upon an acre to forty-seven tons, two hundred, three quarters, and two pounds, *i. e.* one hundred and five thousand five hundred and ninety pounds.

	T.	C.	Q.	lb.		Pounds:
An acre of drilled turneps	47	2	3	2	or	105590
An acre of broad-cast <i>ditto</i>	43	5	3	6	or	96970
In favour of the drilled	3	16	3	14		8620

Thus we see, that, notwithstanding the extraordinary proportion of manure, and the extraordinary ploughing, which was afforded to the broad-cast turneps, the drilled crop, with intervals of five feet, produced the greatest quantity upon an acre, by three tons, sixteen hundred, three quarters, and fourteen pounds weight.

The drilled turneps in my other fields were very large, regular, and even crops, as many gentlemen saw during their growth.

Those

Those sown on the acre manured with the shell-marle were very near as good as the rest—those sown on the potatoe ground were not near so large, but were regular—those sown on that part of the fallow-ground which was limed, were very poor crops—and those sown on the ground manured with the native earth were miserable.

The crops in my other fields were all treated in the same manner as that already described; except, that the fallows were broke in September, 1763, instead of March, 1763.

It now remains to describe the nature and quality of the land, and then to draw conclusions from the various experiments.

The land lies upon a lime-stone quarry, which is very near the surface; and is, naturally, a very strong and stubborn soil, with an infinite number of loose lime-stones in it. With dry winds, or a parching sun, the ground unites, and is as hard as bricks; moderately wet, it is reducible by instruments; but, when thorough wet, it runs together, and is like brick-clay when tempered. This, I repeat it, is the natural quality of the land, and is what the writers would call a barren, grey, stiff earth, but is not quite a clay.

I have found repeated tillage, when the land is in a proper state of moisture, will reduce it, and divest it of its natural adhesion. Tillage and manure together render it capable of producing any thing; as, I believe, such agents will do upon any land, provided it can be kept moderately dry. The fields, which I had under turneps and cabbages, have been in appearance all the summer a fine loam, and really bore the complexion of very fine land, abstracted from the rich appearance of the crops.

I recommend to the practice of all persons, who may have such land as this to work upon, never to harrow the fallows before winter, but as early as may be in the spring, and during the working the fallow in the summer, but not to leave more than one day's ploughing unharrowed, but rather harrow in the evening what has been ploughed

in the morning, and then the harrow will reduce it; but if the ploughing is continued for two days, without any harrowing, the harrow will have no more effect upon the land, than it would have upon bricks, unless it be moistened with rain; in which case it will be reducible, as, it may be remembered, I described the potatoe ground to have been reduced, after rain which fell on the twelfth of May.

Conclusions to be drawn from the preceding Experiments.

These experiments prove gardens to be no more than farms in miniature, under an extravagant expence of culture; since we can with the plow raise more tons of the larger kinds of garden vegetables for twenty shillings, than by the spade for as many pounds: and indeed, I do not see, why most of the small ones may not be raised in the same way.

They also prove, that it is profitable for the farmer to raise different species of cabbage for his cattle in winter; and I have it in contemplation to try them for summer use also. However, for the winter, it is an object of great importance, not only to the well-feeding of cattle, but to the saving an infinite consumption of hay, which by this husbandry may, at least, be pastured in summer.

The experiments on the turneps prove, first, that it is more profitable to raise them in drills, than in broad-cast: secondly, that the culture is a great deal cheaper: thirdly, that less manure will produce a larger crop, than in broad-cast, provided it be disposed in the same way as mine was: fourthly, practice shews the expence of drawing the drilled turneps for sheep or black cattle, to be at least two-thirds less, than drawing the broad-cast: fifthly, in the drill way not a turnep need be left upon the ground; whereas, in the broad-cast way, the leaving many is unavoidable, to the great annoyance of the succeeding crop, particularly if that shall be barley: and sixthly, that the land is left, after drilled turneps, in a much higher state of preparation

paration for a succeeding crop, than it can possibly be in the broad-cast way. To these advantages another may be added, which I find very material, *viz.* that of slicing them for black cattle, which is highly necessary, even when they are small, nay more so, for cattle are sometimes choaked with a small turnep. A man will be near as long slicing a small turnep as a large one, and will make no dispatch; whereas, my men and boys now slice for me every evening about nine hundred weight in an hour; which is a task upon them after night-fall, except on Saturday nights; then they slice double the quantity.

As it seems to be a paradox to say a man will slice a large turnep as soon as a small one, it may be proper to explain it to the reader. The man is in danger of cutting his hands when he is slicing a small turnep; but in no such danger with a large one: and, besides that, one slice of a large one contains more food, than two or three whole small ones.

These experiments prove, that the potatoe tillage, in the manner it is now generally practised, is not so beneficial an improvement of land, at least not of strong ground, as is generally imagined; although there is a greater consumption of dung than in any other husbandry.

The experiment with the lime, upon the fallow ground, proves lime to be an insufficient manure, for the high improvement of lime-stone ground. There are so many advocates for lime as a manure, that it is adventurous to say any thing against it; but, I hope, the reader will observe, that I pronounce upon it, as being insufficient, "for the high improvement of lime-stone ground." I have tried lime in another field of my farm, in which I sowed wheat, and my success was no better in that than in my turneps: and I earnestly recommend it to every improver, who may have favourable opportunities of getting lime, that he try it upon a small patch, before he launches into a large expence for it; such caution may perhaps save him money. This advice arises from practice; for, I imprudently burnt a large quantity of lime, at an expence of near an hun-

dred pounds, and, I can truly say, I have not received in benefit as many shillings.

The experiment with the shell marle, proves that to be a very high and excellent manure ; for, as it will produce turneps upon poor ground, it may be safely relied upon for any other crop.

The native earth proves to be perfectly insufficient for turneps ; though it certainly mends the ground a little, besides that it adds to a shallow soil.

Accidents and Distempers.

Turneps are subject to be destroyed by the fly. In an orchard I sowed two acres with turnep seed in drills in July last. They were invaded by the fly ; I had a contest with them for a fortnight, and at last conquered them, with a loss of only four or five perches of my turneps, which happened where there were most trees. Every morning before the dew was off, I had the rows dashed with lime, which was slacked every day on purpose. This lime adhered so closely to the leaves, when they were wet with the dew, that it defended the upper sides from injury : then I found the flies began upon the under side of the leaves, which I had never seen them do before ; however, upon this, I was obliged to have the dust thrown very low ; and, whilst the plants were wet, a great deal adhered to them, even on the under sides :—thus I saved my turneps, which were as fine a crop as any I had, save the four or five perches before mentioned.

The upper side of the turnep leaf, in its infant state, is very smooth, and on that part the flies always lodge, unless they are interrupted ; in that case they will destroy the plants by wounding the under side, which is not so inviting to the insect as the upper, it being a little rough, though not enough to protect it from them.

The greatest inconvenience I found in this work was, that every little shower of rain washed off all the lime, and then the work was to begin again ; sometimes I repeated

peated it three times a day : however, it will be found to answer well, but it requires to be done with care.

I have, by the same method, saved lucerne, which is also subject to be destroyed by the fly, upon its first coming up.

I discovered last season three distinct species of the turnep fly (if I may so call it) one of them is black ; it seems to hop like a flea, and resembles it exactly. The second is a small degree larger, and very distinguishably has wings, upon which are two small white specks ; and the insect is of an oval form. The third is like a domestic fly, but not by a fourth part so large.

The turnep-cabbage is subject to the rust, or mildew. In my orchard I had some plants put out, at different distances, for experiments ; they grew very well for a time, but they were all infected with the rust, and those nearest the trees suffered most. In my field I could find but three, which were injured by this distemper. This seems to prove, that they require an open exposure ; and therefore they better suit the purpose, for which I have recommended them.

Turneps, cabbages, turnep-cabbages, and boorcole, are food for black cattle and sheep.

A sheep, I find, will consume about twenty pounds of turneps in twenty-four hours, provided they are allowed as many as they can eat, which should always be allowed to fat sheep : but as sheep vary in size, so I presume will they consume more or less food.

An acre of turneps, of forty-seven tons to an acre, will maintain one hundred sheep fifty-two days, allowing each sheep twenty pounds a day. My sheep weigh about twenty pounds a quarter.

In the month of November last, I gave my sheep access to some pea-ricks, which I had erected on purpose for them, of which they eat with great eagerness ; but I find they affect them in the same manner as they do horse, when given to them new ; for the sheep, I apprehend, from violent cholicks, which, I conceive, the peas gave them,

them, were seized with strong convulsions; and in this way I lost six of them, in a few days, before I considered what could be the cause: but having examined the intestines of every one of them, and finding no symptoms of any other disease, I was led to draw the above conclusion; and what seems to confirm my opinion is, that I have not lost one since I took them from the peas. If other persons have not met with the like accident, who have fed their sheep with new peas, it should seem that turneps and peas together do not agree with sheep.—However, that is a fact which I shall soon be able to determine, for I shall admit the sheep to the peas again to-morrow, which will be the twentieth of February; a season in which it is imagined we may safely give peas of the preceding year to horses, and therefore, I conceive, there can be no danger in giving them to the sheep: but, if they should be affected as they were before, I think there cannot remain a doubt, that the peas and turneps disagree in their stomachs. And here I shall leave a space to add to my report hereafter.

Now, the fifteenth of March, the sheep have been ever since at the peas, and I have not lost one.

Of cabbage, and turnep-cabbage, a sheep, of about twenty pounds a quarter, will consume about fifteen pounds a day. An acre, at that rate, will maintain one hundred sheep about thirty-four days. The cabbage, and turnep-cabbage, are a firmer and more substantial food than turneps.

I have fed a cow this winter upon turneps, and I have now two bullocks which are stall-feeding upon turneps also. It is computed that they weigh between four and five hundred weight each; and I find by experiment, that they each of them eat about two hundred and sixteen pounds in twenty-four hours; which is, therefore, about half their own beef-weight; from hence we may, with reason, imagine a beast will eat every day of turneps, at stall-feeding, about fifty-six pounds for every hundred weight of beef he may contain.

One of the bullocks was put up miserably poor from the plough, for an experiment, on the fourteenth of December:

December: he took kindly to the turneps; and on the sixteenth I began to give him, with his turneps, pea-flower, to the amount of eight pounds every day; and I find he is greatly improved, but he will not be beef; though I am very inclinable to think, that if he had been put up six weeks sooner, in April, he would have been good beef. This experiment I shall repeat next year. What induces me to mention it here is, that some other persons may perhaps try it next winter, and, if they should, I shall be much obliged by their report of the effect. I am led to believe, that bullocks may be profitably fed with peas, because horses, and pigs, thrive very fast upon them.

When the cattle are first put to turneps they dung but little, the turneps going off chiefly by urine, the quantity of which is really incredible; but, after some time, they dung more; and, from a whitish colour, the dung resumes the natural colour, and is of the common firmness. I allow each of the cattle seven pounds of hay every day, and I do not find that they eat fewer turneps on that account; the reason, I believe, is, that the hay makes them more eager for the turneps. They refuse water.

To each of my cows, and store-cattle, I allow seventy-two pounds of turneps a day, and a little straw, thirty-six pounds being what I find a moderate-sized beast will eat at a meal. To my plough bullocks I allow the same quantity of turneps, with as much straw as they can eat; but I forbid their having the turneps till they have been unyoked about an hour, and after they have eat some straw; as I conceive the turneps are too cold for them immediately after their labour.

I have lately confined a milch cow four days, and fed her with turneps, and I could find no disagreeable flavour in her milk from that food, though I have often heard turneps complained of as giving a bad taste to the milk, when cows are fed with them. Query, Whether it might not arise from the leaves of trees falling upon the turneps? Leaves of trees always spoil the milk when cows eat them.—Here follow,

Calculations upon the Feeding Black Cattle with Turneps and Cabbages.

Suppose four cows or bullocks, of four hundred weight each, to be stall-fed upon turneps, allowing each beast two hundred and sixteen pounds a day, an acre of forty-seven tons would maintain them one hundred and twenty-one days. Indeed a larger stock should be put up, or heavier cattle, as the turneps will not keep so long.

Suppose ten dairy cows to be maintained upon turneps, allowing each cow seventy-two pounds of turneps a day; at this rate, an acre of forty-seven tons will keep them one hundred and forty-seven days. All cattle, fed in this manner, should have about seven pounds of hay a day allowed to each.

The fat cattle eat about one hundred and a half of cabbages a day; therefore an acre of twenty-three tons will, at that rate, maintain four bullocks, of four hundred weight each, seventy-six days.

When fed with cabbages, they dung more, and make less urine, than when they are fed with turneps, and will drink a little water.

Hence I am induced to believe, that cabbages are a better food for cattle than turneps. I am fully persuaded near as many tons may be raised upon an acre, with proper seed and good management; but they will cost five or six shillings an acre more.

There remains one general observation to be made, and which I imagine contributed greatly to the success of the above-mentioned crops, viz. that we had for these species of crops, very seasonable and fine rains. From the sixth of July, on which day I began to put down my cabbage-plants, to the first of December, both inclusive, we had seventy days, in which there was, more or less, rain; and the latter end of August, and beginning of September, the heaviest dews that I have seen. From the sixth of July to December the first, both inclusive, were one hundred and seventy-seven days; so that we had but one hundred

hundred and seven dry days, many of which I see by my kalendar were cloudy, and inclinable to rain.

NUMBER LIII.

Queries, Experiments, and Remarks, concerning Lucerne, Burnet, and some other Articles of Husbandry; in a Letter from James Crockatt, Esq; to the Editors; and in three others to him from Mr. Lewis, Mr. ———, and Mr. ———.

GENTLEMEN,

AS you seem to think the publishing of a letter from John Lewis, Esq; to me, (concerning burnet-grass, in Numb. XXVII. of your *Museum*, &c. for August last) will be of service to the public, and as I would be glad to contribute every thing in my power for promoting of husbandry, through the channel of your useful collection; for that reason I now inclose you another letter from the same gentleman, in case you think any part thereof worthy of inserting in your *Museum*. I also inclose you another letter from a gentleman in Kent, which, I think, contains some very good directions concerning burnet.

I also inclose a letter from a very ingenious gentleman in the south-west of Scotland, who is remarkable for his improvements on instruments useful on the Tullion or drill husbandry; and as I have taken a great deal of pains for these twelve months past to procure a set of instruments proper for that practice, but all in vain; for I never could see any, till, by the assistance of a friend, I did, fourteen days ago, receive a complete set of these instruments, made by Mr. Alexander Creighton, coach-maker, in Edinburgh, viz. the drill-plough, which sows, rolls, and covers all kinds of seeds or grain, from clover to peas, and at any desired distance, either of length or breadth; single horse-hoe; a double *ditto*, and a double mould-board; and marking-ploughs; the square harrows, and

the triangular : many of these I have already tried ; and my ploughman, who never saw such things before, manages them extremely well. In short, I am so well satisfied with the use, that I readily recommend them to other gentlemen farmers ; and if any such think it worth their trouble, they will do me pleasure to come here and see them any day, Wednesday and Thursday excepted, for I am then commonly in London.

As I keep minutes of several experiments made this year, so in a few weeks I shall communicate some of the most material of them to you, and expressed in the plainest manner, so as, I hope, they will be understood by all farmers * ; and yet this is too often the case in most of our books of husbandry, not excepting even Tull himself. I shall also endeavour to avoid a common error in most husbandry books, in giving such directions as is not possible to be understood : for example, *don't sow it too thick, nor too deep—take a handful—spread a good deal of soot ; sprinkle it very thin—steep it well in brine, or a proper mixture, &c. &c.*†

These, and five hundred other such directions, are of very little use ; and, in my opinion, perplexes more than instructs the reader ; at least I have found it so in many instances, even when I am told to lay twenty loads of dung, marle, ashes, &c. on one acre ; for a load is not the same in every county of England, being in some parts twenty bushels, in others forty bushels. Many letters, &c. are without a date, as to time or place. In a letter lately published in your *Museum*, Numb. VI. a person

* Although there will not be one word of French, Latin, or Greek ; for, in my opinion, it is extremely improper for any person, writing on husbandry, to give scraps of any foreign language to an English farmer.

† What Mr. Crockatt says here is very true, and we hope our correspondents will be so kind to pay some regard to it ; as it will render their good endeavours for the public service much more effectual, to be explicit and clear in all matters of this kind. R.

tells you of keeping cows and sheep on carrots *for a fortnight longer*. I find he takes his hint from Billing's pamphlet on carrots, fol. 30; but that letter has no date, and, in course, the question is, When? for the date is not known. But it may be answered, as I am a young farmer, so by experience I may know what is meant by such expressions. Yet, as I do not think it possible, I therefore pray the favour, that when any such mysterious expressions occurs, you will explain the same, as far as you can, which I believe will give great satisfaction to many of your readers, as well as to,

GENTLEMEN,

Luxborough,
Sept. 24, 1765.

Your most humble servant,
JAMES CROKATT.

P. S. Mr. Billing in his Treatise on Carrots, fol. 31. refers to particulars on that subject, sent to Dr. Templeman. Another gentleman, writing on burnet, refers to what he had wrote to Dr. Templeman, no doubt, with intention to be published for the general good of mankind. But I am told that he (I presume by order of the society) puts all such letters, papers, &c. in what they call the guard-book, which seems to be a very proper name; for it is so strongly guarded, that there has scarce one article for the good of the public been published from it, that I know of, excepting the description of the Hainault scythe, in the Gentleman's Magazine, November 9, 1763, with a drawing thereof*; but what is meant therein by a *scythe, with a short blade, being about one-third of the length of those commonly used in England*, I know not, for I am told the length differs in several counties in England. I am, &c.

J. C.

* Nothing is put into the society's guard-book, by the secretary, unless by particular express order from the society: and all the papers are open to the inspection of members. Any gentleman, therefore, on becoming a subscriber, may have access to the guard-book whenever he pleases. The society have occasionally printed other papers, as well as that mentioned here. R.

QUERIES.

I. If you cut the lucerne, and carry it daily to the horses, being the custom in France, or if they are put in the fields to eat it?

II. At what time do you sow and transplant your lucerne, and what age when transplanted?

III. If you allow three-foot ridges for drilled lucerne-seed? I made mine last year three feet four inches. Should not four feet be allowed for that transplanted; for as the seed root runs deep in the ground, and the transplanted runs horizontally for food, I think more space is needful? What I have transplanted is in four-foot beds, or ridges, a foot distance from each plant in the row.

IV. What is the width of your ridges for wheat, beans, peas, turneps, and potatoes? Also the width of the intervals, or furrows, and distance in the rows?

To James Crockatt, Esq; Merchant, in London.

S I R,

I Was favoured with yours of the tenth instant, in answer to mine of the fourth; and you are welcome to publish the said letter, with my name, if you think it will be of use to the public.

I observe your plan is (if possible) to have a regular succession of grafs for your horses, &c. from January to July; and that you propose cutting a proportionable quantity every day, and to feed your cattle from racks standing in your ground; to which I answer, that the trouble is very great, and, I think, expensive, as you will find, both in cutting your lucerne and burnet. My method is this: I have made one hundred hurle-gates, as we call them, which cost me one shilling each the making; and with these I divide my land, acre by acre, as the cattle eat it down; and if you keep your horses out by day, and take them in by night, you will find them more healthy and strong than keeping them in the stable all winter: and when you

have made a fair trial of the burnet and lucerne, I am pretty certain you will approve of the former and condemn the latter. By your scheme you may have grafs from January to May in a moderate season.

The field where you had a crop of oats will do exceedingly well for burnet, and you may, I think, depend on a fine crop, unless the manure laid on is too thick, and should subject the field to weeds, which you will be careful of at first. This mud-manure should be now carried out in heaps, and the chalk mixed with it, and often drawn, which will destroy the weeds which usually abound in manure of this kind; besides, it sweetens the whole mass, and will make as fine compost as any can be. Your field of ten acres must also do well for the burnet and lucerne, which will be a fair experiment on both these grasses; and if you can have time to burn the surface, it will be much the best way.

Fallowing of ground is very necessary, as it sweetens the mold, and kills the weeds; but if your earth is fine, and of a loose texture, it will do very well; but if it be of a firm binding loam, then, I think it absolutely necessary to fallow it; and so for any other grafs-seeds, or grain.

The hay from which I had my seed is the best I have made this season, except that which I cut before the seed was ripe, as mentioned in my last; and I propose keeping my horses on it the winter, without oats.

The field in which my burnet grew is ten acres, six acres to burnet, and four to honeysuckle and rye-grass; and as we have had, since my last, some rain, the burnet looks quite green, and grows fast; and the four acres of honeysuckle clover looks quite barren. The whole is now stocked with feeding cattle and horses; and the whole stock keeps on the burnet, and does not touch the clover. In short, I expect a fine crop from the burnet this autumn.

I am, with respect, SIR,

Your most humble servant,

Tracey, near Honiton,
Aug. 15, 1765.

JOHN LEWIS.

P. S. I

P. S. I have this day sent you a sack of burnet-
seed, very good, weighing one hundred and
twenty pounds nett, at — — 6 4

Sack	—————	—————	—————	0 2
				6 6

To Mr. James Crockatt, Merchant in London.

S I R,

YESTERDAY I received the favour of yours the 22d; and I assure you I am very ready to give you all the information I am able concerning the questions you ask.

The field which I sowed with burnet, is a strong dry loamy soil, and full of flints. The year before it bore a very good crop of wheat; early in the winter, I plowed in the stubble very *deek*, intending it for a turnep season the following summer, as the land was very full of dung; but hearing much of burnet, I determined to sow this field as the most proper one I had with it: accordingly I made it as good, and pulverized a summer fallow as the very dry season would admit of. August 4, 1764, I sowed it in the following manner: The roll went first, immediately after the sower of the burnet, whom I charged to sow no more than six pounds upon an acre, which he performed pretty exactly; after the sower followed a pair of light harrows, and in this manner we finished the field in one day once over: the next day we sowed it over again cross-ways, with six pounds more to the acre, after the roll; by these means the seed was scattered as exactly as possible. We harrowed in the seed twice in a place, and crost it, then rolled it down, and so finished. In about nine or ten days it came up with two small round leaves; and a fine rain falling very opportunely, the burnet grew away, and flourished exceedingly, and, as I thought, out
of

of all danger: however, no rain coming for near six weeks, it began to be at a stand, and then the fly fell upon it, and I feared had demolished it entirely; but the cold nights and rain soon recovered it, and it now looks as fresh and green as any meadow in May. *I was at a great expence in weeding it, as I would not trust a boe in it, fearing they would cut it up; and I did not care how thick the plants were, as they will bear transplanting as well as a cabbage. I therefore spudded up the weeds, and did so three times over before the end of October.*

If I was to sow lucerne, as I intend to do as soon as ever I can prepare any land fit for it, I would sow it broad-cast twelve or fourteen pounds to the acre by itself, and keep it clean by a particular sort of harrow made for that purpose. Mr. Roque has one of them, as several others I believe about Fulham. Lucerne, though a most excellent plant, yet is a very cowardly one, and soon destroyed by the grass, if suffered to over-run it; and the common methods of keeping it clean are so very expensive, that I am persuaded that has been one chief reason why it has been so little cultivated; whereas this harrow will keep it clean at a very small expence, by harrowing it every time you cut it twice in a place cross-ways; and then I think with you, that by the help of burnet and lucerne we might have grass all the year.

In answer to your first question, I think that any soil will do for it, provided it be not too wet; and the better the land the greater will be the crop: it is not necessary that the land should be very deep-moulded, as the burnet-root seems not to run very deep; only take care to make it a very good summer fallow, or you may sow after turneps. To your second question twelve pounds upon the acre. To your third, as I have succeeded so well, I should sow in August. Fourthly, sow as I have done. Fifthly, I should rather prefer mowing it than feeding, as I do not know whether it will bear treading upon in wet weather; and I am sure there be less wasted that way. After what I have said, I think you will be best able to judge which
of

of your fields is most proper to sow with it. I heartily wish what I have wrote to you, may give you satisfaction; if not, let me hear further from you, and you may depend upon an answer from

Monday,
Feb. 25, 1765

Your very humble servant, &c.

To James Crockatt, Esq; at Luxborough, in Essex, near London.

S I R,

I AM favoured with yours of the 5th of July, which I would have answered sooner, but my being from home prevented me.

My observations and experience, such as it is, shall always be at the service of any gentleman, whose inclinations lead him to that innocent and profitable amusement.

I have had for some years about six of your acres in *horse-hoed lucerne*, with which I feed my work-horses in summer green. One part of this field is in single rows, on three-foot ridges, and another part in double rows on five-foot ridges, the partition a foot wide, and the plants a foot distant in the rows: but upon weighing two of the three-foot ridges, and one of the five-feet, I found the two single rows produce near double the quantity of the five-foot ridge, and therefore propose for the future to plant my succeeding plantations all in single rows upon three-foot ridges.—I had a few ridges drilled, but the rest were all transplanted; and also find those which were transplanted superior to the others.

Aug. 12, 1765

Your's, &c.

NUMBER LIV.

Queries relative to some particular Land, with respect to Manner, Number and Kind of Crops, and the laying it down in Grass.

GENTLEMEN,

AS I have seen with pleasure in your truly valuable collection, the *Museum Rusticum*, several instances of your obliging condescension in giving advice, not only from yourselves as editors, but by the kindest invitation requesting the same from your correspondents, I have the satisfaction to observe several worthy and able contributors, who seemingly take a delight in communicating their practical and experimental knowledge, in the different branches of agriculture: a knowledge, replete with such interesting events, that not only the welfare of the nation in general, but the individual in particular, are at this time more especially concerned, the exceeding high (I had almost said unnatural) price of provisions is at this time so greatly enhanced, that the wages of the labouring poor bear no just proportion to the necessities of life, let their management be ever so frugal. I am really astonished when I reflect, that a poor labourer, who earns but five shillings *per* week, should support himself, a wife, and seven or eight children. Is it possible that this scanty pittance can purchase such a family sufficient victuals, cloaths, and pay forty shillings a year rent? I have not mentioned firing, that is absolutely necessary, but altogether impossible for them to buy, which lays them (who otherwise would not) under a necessity to break down their neighbour's fence, to the great detriment of the farmer. This, gentlemen, is really the case of several families in this neighbourhood; and, I doubt not, but most other countries can furnish out more such deplorable circumstances.

Doth not such moving pictures of distress, call upon every humane and compassionate lover of his country, to exert his best abilities in their support and defence? I think one great step towards this laudable charity, is, to encourage to the utmost every branch of agriculture; and I have a peculiar happiness to see, through the channel of the *Museum Rusticum*, noble advances towards that great end. Pardon this digression, and suffer me to return to my first and ultimate design, which was, solely, to beg advice. But it will be first necessary to give you an account of my former and present situation. I was, gentlemen, brought up a mechanic, and followed a laborious trade for some years; but not being blest with the strongest constitution, I greatly impaired my health, by too close an application to the duties of my occupation; and was thereby obliged to lay by the laborious part, and content myself with the care and management of it. This allowed me some little time for amusement. I found none more innocent, healthful, and at the same time so profitable as gardening. Being naturally curious, I was not content with the common methods as practised here, but called in to my assistance both experienced men, and the best instructions from books. I made a considerable proficiency, and succeeded even beyond my expectation. This naturally led me to view the fields, which I considered as more extensive gardens, if well managed. For what is right in the last, cannot be wrong in the first; allowing for variety of soil, situation, and other accidental circumstances. The great satisfaction and pleasure I took in this way of life, determined me to seize the first opportunity of taking a small farm, if any such should become vacant, by death, or removal in the village where I reside. For then (I thought) I could superintend my trade, and have some leisure to manage a few acres. Fortune (I will not yet say good) soon aided me in the completion of my wishes. As a little farm of twenty pounds a year was quitted by the possessor for a larger, and through his respect and good-nature I was made acquainted with his design, I immediately made
interest

interest to the landlord, and succeeded, and entered upon it the Lady-day preceding the date hereof. I found, upon measuring it, that I payed eighteen shillings an acre, which, compared with my neighbours, is a very high rent, as they in general do not pay more than nine. The condition of my land is mostly indifferent, chiefly through the neglect of my predecessor: being covered with docks and thistles, I found one piece, at my entrance, a wheat stubble, something more than three acres. The spring of the year being very rainy, and the land naturally wet, and poachy, I could not get it plowed till the season for sowing was rather too far advanced. However, I sowed it with oats, clover, and rye-grass. I had, as I expected, a very indifferent crop; and what is still worse, I have little clover or rye-grass *. Now, gentlemen, in this situation, I beg you, or some of your kind correspondents, will favour me with what method they would advise me to pursue, in the management of this piece of land: for I would lay it down to grass, as soon as it may be done, with a prospect of success. It will not be improper to inform you, that there is a stiff kind of marle, or rather approaching to the nature of a mild clay; in the same piece, the land is light and spongy: will, or will it not, be expedient to marle it? When is the marle to be layed on, and in what quantity? What is the manner of the after-treatment? How many crops, what kind, and what seed to be layed down to grass with? Whether Timothy-grass

* Clover, rye-grass, and trefoil, are all the artificial grasses at present known here. I should be greatly obliged to Mr. Rocque, if he would let me have a few ounces of every species of grass that he cultivates. I have desired a friend of mine to call upon him sometime after Christmas. I mention this now, that he may, if agreeable, save some for me, as above; lest he may, by that time, have none to spare. I should be glad to know the price of Timothy-grass by the bushel. I have collected several kinds of grass-seed; and one of the trefoil kind, which appears to be different from any species, I have yet seen. I have prepared a patch of land, with a design to see which is likely to be of the greatest utility.

would not suit the soil, as it is, as I said above, naturally cool and moist? Mago has favoured Mr. Scott on a similar occasion. Perhaps he may oblige me also. I shall with gratitude acknowledge the obligation *.

I have several more material petitions to offer, but must suspend them, till I see this meets with acceptance. Perhaps a correspondent, capable of giving instructions, may be more acceptable than one desiring it. But, gentlemen, if no body wanted, none would be needful; and, consequently, there would be no occasion for a *Museum Rusticum*. But this is far, very far, from being the present state of agriculture (especially here); and I am afraid it is no where arrived to that perfection, but that it is still capable of great improvements: and I think nothing can be better calculated for that purpose than your publication. I could wish it had more readers †, for then I should believe the nation would be in earnest, to cultivate many thousands of acres, that now are covered with every kind of rubbish:

* The questions asked here are not so properly of a nature for the editors, as for others to answer; and, indeed, as they relate rather to points of common practice than improvement, they are not strictly within the province of this work. But, not to deprive the ingenious gentleman, who wrote them, of an opportunity of seeking the information he desires in this way, especially as it may at the same time give occasion to some useful discussion on the very material query, of what sort of manure such kind of ground requires, we have thought proper to give his letter a place. Single questions, on particular points, and those too not respecting matters familiar in practice, are most suitable to this work; and the acknowledged success of some, which were of this nature, made by Mr. Scott, Mr. John-Wynn Baker, and others, shew, that private persons may receive benefit, and the public the advantage of useful information, by proposing similar enquiries. E.

† The continuance of your *Museum* proves, that you have many readers. All that I mean, by saying I could wish it had more, is, that every farmer, capable of reading, would be a purchaser. It would be then, that we should see an agreeable emulation in the too-much neglected improvements in husbandry, and enable you to give us models of every useful invention relative thereto.

a severe

a severe reflection, to a nation where arts and sciences are so well understood, and flourish so much, and its inhabitants otherwise so very industrious. If these lucubrations are consistent with your plan, I should be glad to see them published; if not, you have my free consent to suppress them. All the mortification I can feel, is, only being deprived of your, or correspondents, advice (which would indeed be highly acceptable). However it may be, I shall continue a devoted reader, and a well-wisher to your design. If you honour me with acceptance, I beg you will correct every inaccuracy of language, and to prune away every unsightly exuberance, so that I may appear to the public, in a light favourable to your design and my instruction. I am, gentlemen, in one word, a well-wisher to every useful improvement, and an encourager of your laudable scheme; and am, with very great deference,

Your very humble and obedient servant,

Near Stafford,
Oct. 10, 1765.

MECHANICUS.

NUMBER LV.

Further Reflections on different Accounts of the Success of the Culture of Burnet, with Answers to Queries relative to that Plant.

GENTLEMEN,

THE *real value* of burnet is a subject of too much importance to the public, to be either *slightly passed over*, or *delayed*. If it is really that profitable fodder, which its patrons celebrate it for, it cannot be too soon cultivated with *assiduity* and *resolution*. On the contrary, if it be not so, the great expence which will attend any further considerable trial, should be immediately saved. If the facts already established be not sufficient to authorize
a con-

a conclusion of its great usefulness, or the contrary, we should endeavour, as soon as possible, to establish such as may ground one conclusion or the other.

Your correspondent, "A Lincolnshire gentleman farmer," (in Numb. XXXII. of your present Volume) very sensibly says, "I would not, gentlemen, by any means wish to discourage your readers from making experiments in agriculture. I am fond of them myself; and really they are of very great service; yet I am firmly of opinion, that experiments which do not succeed, ought to be made known as well as those that do, as it will save much *trouble* and *expence* to your practical readers."

In consequence of this sensible judgment, the *gentleman farmer* has told you how very ill burnet has succeeded with him; and yet he has candour enough to suppose, that his ill success may have proceeded from the *poorness* of his soil; and that *burnet* may do *very well* on *very good* ground. But if we admit this supposition for fact, much of the value of burnet is sunk: for some of its patrons (as the *gentleman farmer* observes) have recommended it as thriving on poor sands. This circumstance, no doubt, induced many persons to try it; as they have with success tried *saintfoin*. We know that lucerne will thrive *very well* on *very good* ground; and if the expence of the culture can be kept within any moderate bounds, it is probably the most profitable grass on such soils. But we were taught to expect *as profitable* a crop of burnet, or even a *more profitable* one, on *poor*, *very poor* grounds. And if this is not the case, a considerable part of the excellence of burnet is gone.

The circumstance of the *gentleman farmer's* burnet running all to stalk, with very few leaves on the plants, is very remarkable. One would think that the same strength of soil, which is necessary to produce the stalk, would be sufficient to produce leaves; and so uncommon a phenomenon seems to deserve a *particular explication* by some of your ingenious correspondents.

Your

Your correspondent adds, that his burnet was *worse* this year than the last. Does he mean that the plants had *fewer leaves*?

But what the *gentleman farmer* cannot say for burnet, Mr. *Lewis* does (in Numb. XXVII. of this Volume). He judges a *dry deep soil* to be the best for it; and in this, I think, he judges right. He adds, that "it runs down in a *spill* like a young carrot, six and eight inches."

It appears that Mr. *Lewis* sowed his burnet last year, and that it came up tolerably thick in *August* and *September*. He says not *when* he sowed it, but probably in *May* or *June*. He reaped, however, no advantage from it till *May* in this year. But, gentlemen, have not the patrons of burnet taught us to expect a crop the first year? If they have not, my memory is very bad; and if they have, we are shamefully *imposed on*, while we reap *nothing* the first year.

The soil in which I sowed burnet this *May*, is a dry good one, loam with a mixture of small warm gravel, the same on which I have grown good carrots. On reading this account of Mr. *Lewis's* burnet, I went this very evening and pulled up two roots, which I found to be eight inches or more long. I had reason to have expected as good a crop from this length of root, as Mr. *Lewis* had; and yet the tops of those very plants were not above five or six inches long; not comparable to my lucerne adjoining to it, and sown the same day.

Mr. *Lewis* tells his correspondent, that he may have a crop of seed in the *beginning* of *July*; yet he says *his* was reaped, and therefore we may suppose *ready* only about the twenty-fifth of *July*. One of you, gentlemen, is convinced, that Mr. *Rocque's* seed is ripe in *June*; and, I believe, I gathered in *June* ripe seed from some plants sprung from Mr. *Rocque's* seed, even so far northerly as this place. I might have added, that there is only one plant of my this year's burnet which shews any tendency to flower, and this is in full flower.

But

But I am greatly surpris'd to hear gentlemen talk, or to see them write about mowing a crop of *burnet* for feed, as if this were the *only* or *best* way.

If other people's *burnet* grew as mine does, every plant of *burnet* of the second year shews seed preparing in all conceivable gradations when the topmost is ripe. Whoever then mows *burnet* for seed, must mow a great deal which is *unripe*, and many flowers which are just in full bloom, and many which are not yet in bloom. Every body knows, that much of the seed not fully ripe will thresh out with the ripe seed. This method will do mighty well for those who thresh in order to sell at two shillings *per* pound; and as a great deal of such seed will not grow, a larger quantity will be wanted for sowing an acre; consequently the sale be increased, and the profit in proportion. But if any gentleman desires to have the *best* *burnet*-seed, he must gather by hand the top-seeds, as they ripen, and he will find that a much less quantity than has hitherto been thought of will sow an acre sufficiently; and he will have a constant succession of good seed from the same plant.

I cannot by any means agree with Mr. *Lewis*, that *burnet* cannot *easily* be sown too thick. I cannot comprehend his reason, *viz.* that thick sowing must support the plants, when *young*, in *severe* frosts *better*. The *strength* of every plant is its support, and not its *nearness* to another, in frosts, &c. The nearer plants are, the *weaker* they will be; and if the *nearness* be not harmful when they are young, (as it cannot be *beneficial*) it will be so when they grow up.

As to what Mr. *Lewis* adds, that the crop of hay will be *proportionally* larger, it contradicts the principles of *the new husbandry*, and indeed of *all* vegetation. I ascribe the lowness and smallness of my *burnet*-plants of this year's sowing, in some measure to their being too thick sown; the roots being not near *so thick* as Mr. *Lancaster's*, which grew at a greater distance, when sent to me about the same age. There is no fear of frost for the young plants.

Your

Your personal acquaintance, gentlemen, with Mr. *Rocque*, may be a good foundation for the *candour* you shew to him in the note on the *Kentishman's* letter: but to us, who have no personal acquaintance with Mr. *Rocque*, the accounts which the *Kentishman* gives, must appear very suspicious; especially as many *facts* seem very unfavourable to the culture of burnet, and give room to think that Mr. *Rocque* may not be unwilling to decline questions on the subject.

Your *Old-fashioned Farmer* tells you, that Mr. *Rocque's* burnet produces a great burthen; but adds, that it is so *stalky* and *stiff*, that it is more fit for *fuel* than *hay*. This seems surprising; and it is pity that the letter-writer is *anonymous*, so that one knows not what credit to give to him. I have never seen any of Mr. *Rocque's* burnet which had this quality of *stalkiness* and *stiffness*; though it is very descriptive of the *great wild* burnet, of which I plucked a plant this year in *June* or *July*, which was longer than my cane, and stalky and stiff to a great degree. I can easily believe the *Old-fashioned Farmer*, that his cattle preferred *all* the other grasses to burnet; but he does not tell us whether or no they eat it *at all*.

Your correspondent Z. N. seems to be actuated by an *honest*, and therefore *laudable*, curiosity; and I shall be glad to gratify it. It was very natural for him to observe the difference of the burnets marked fig. 2. and 3. in your plate, and to enquire whether this difference arose from Mr. *Rocque's* sowing different species, or from the difference of *soils*, *cultivation*, &c. You answer him in a note, that fig. 2. was from a specimen of mine, which I say *positively*, and you *believe, truly*, was raised from Mr. *Rocque's* seed. I took the specimen from a plant sent me by Mr. *Lancaster*, and raised (as he assured me) from seed given him by *Gregory Elsley*, of *Mount St. John*, near *Thirsk*, in *Yorkshire*, Esq; and which that gentleman assured him came from Mr. *Rocque*.

I will, however, clear up the difficulty at once. I took the specimen from the *lower* part of the plant; and that

from which you delineated fig. 3. had been taken from the upper part of Mr. *Rocque's* plant. That this is not a *conjecture*, but a *fact*, is evident from what I observed this very day, *viz.* not only the plant from which I took the specimen, but all the three which I had from Mr. *Lancaster*, have leaves towards the bottom *as round* as the delineation of fig. 2. and they all have, towards the upper part, leaves *as pointed* as the delineation of fig. 3. and upon examination of my this year's burnet, raised from Mr. *Cooke's* seed, originally Mr. *Rocque's*, the case is nearly the same.

This will satisfy Z. Y. as to his query, whether the burnet of your two figures proceeded from burnet of the same species? He will have no room to suppose that they *did not*. He takes it *for granted*, he says, that the burnet delineated from my specimen is the *great garden burnet*; but he is mistaken, if he apprehends it to be *different* from Mr. *Rocque's*. The *bloom* of this burnet is, as I said, of a *whitish* colour; but the leaves under the bloom are of a *reddish*, or even *truly red* colour; in this different from our *wild burnet*, which has a less white cast when in bloom.

There is another point in which Z. Y. is mistaken. He apprehends the whole plant's smelling *somewhat like cucumber* to be the distinction of the *garden-burnet* from the *wild*. I can, with *just confidence*, assure him, that all the *wild burnets*, both the *large*, and that *small* species to which you have given my name, have not only the *smell* but the *taste* also of *cucumber*.

I cannot inform Z. Y. any thing relative to the two sorts of garden-burnet. We had no species in our gardens in the north, till Mr. *Rocque's* account drew our attention.

As it has been confidently asserted, that Mr. *Rocque* took the hint of cultivating burnet from the wild burnet about *London* keeping green all winter, and our great wild burnet in this neighbourhood dies quite down in winter, I have long ago publicly requested that you, gentlemen, and some of your correspondents, would give us an account

of the wild burnet about town, and now repeat my request; and am,

GENTLEMEN,

Your steady correspondent,

October 29, 1765.

THOMAS COMBER.

P. S. Oct. 30. I have this day received more information about burnet, which I will faithfully communicate. *James Cooke*, Esq; by letter wrote last night, informs me, that he suspected, as I did very naturally, that it might be something peculiar in the soil which made his burnet disagreeable to his cattle; and therefore in *August* last he sowed about a pound, the remainder of Mr. *Rocque's* seed, on a piece of ground, which was made very fine, by having had potatoes two or three seasons, in order to have a further trial: and all that he adds, is, that it now looks very well, but is yet low. Being in an ill state of health, he writes with pain, and refers me to his gardener, the bearer, for a proof that wild burnet survives winter in verdure, &c. For full information I conversed with Mr. *Cooke's* gardener, who is a grave sensible man, and has lived about ten years with his master. He informs me, that having observed some wild burnet in the *environs* of *Garton*, he thought the description answered exactly to that of Mr. *Rocque's*, and therefore gathered some of the seed, and sowed it in the garden about August was twelve-months. It came up, and continued green through winter, and has flourished much this summer, and borne seed. He added, that he had brought me a plant as a specimen, and pulled out of a paper bag his present, which appeared to be exactly the same as Mr. *Rocque's*. It is very different from any wild burnet with us; and it is evident, that Mr. *Rocque* has raised his burnet from the wild sort which grows about *Garton*. I was very curious, gentlemen, to know of this person the particulars of dislike to the burnet, which Mr. *Cooke's* cattle had testified. He gave me such an account, as shewed, that Mr. *Cooke* had not taken up his opinion hastily, but had made a thorough trial.

trial. He assures me, that Mr. *Cooke's* horses were confined in the house to burnet about a fortnight (to the best of my remembrance); and disliked it so much, that they eat their bedding rather; and that the sheep being turned into the burnet-field, fed upon the clipped hedge and grass-walk about the burnet, but would not meddle with the burnet itself. This sensible gardener added, that he had observed to his master, that the burnet tastes like linseed oil: an observation, which struck me the last evening when I tasted some of this year's burnet. It is to be noticed, that the *younger* the burnet is, the *stronger* taste of this kind it has; and that this *acrid* oil seems the very cause why the plant resists the force of the frosts, as one of your correspondents has long ago observed.

As I have given you, gentlemen, so much of *experiment*, I may be allowed to hazard a *conjecture*. From the circumstances alledged by the *Kentishman*, that Mr. *Rocque's* burnet with him *run all to stalk*, and had *very few leaves*, and by the *Old-fashioned Farmer*, that Mr. *Rocque's* burnet with him was *stalky* and *stiff*, I cannot help conjecturing, that the *wild burnet* about town, about *Garton*, and about this place, may be *all originally* of one species, and diversified by something in the soil, *our wild burnet* being very like what the *Kentishman* and *Old-fashioned Farmer* describe the progeny of Mr. *Rocque's*, and the wild *Garton* burnet being like what is cultivated by Mr. *Rocque* himself.

The roots of the small wild burnet, which I took up about the 16th of *September*, were exposed to the frost, which came severe for a night or two, when they were scarce covered with earth before setting, and yet most of them thrive.

I hope, gentlemen, the impartiality which I have shewn in relation to this subject, burnet, will reinstate me in the good opinion of your correspondent, *Mago*.

If my conjecture above, that the wild burnet of *Garton* and of *Newton* are only accidental varieties of the same species, be *ill grounded*, as many will think it, because one is *verdant* through winter, and the other not, (though
this

this circumstance may perhaps be accounted for by the soil's supplying our burnet with less of that acrid oil which preserves it from frost,) then we must, I think, conclude, that the *Garton burnet* is the *minor vulgaris*, and ours the *major vulgaris*. Old *Parkinson* talks of a species, which he calls the *inodora pimpinella*; and says, that it has no scent: but I know no species which has it not in some degree, though Mr. *Rocque's* in the *highest*. I dare say, no body ever eat cucumber *ill-pared* or *unpared*, but he found something of that acrid oil in the peel, which is so exactly represented by the *burnet leaf*. I believe, the reason why many people eat the cucumber unpared, is, that the *warm oil* is thought to correct the coldness of the inner part of that fruit.

Whatever be the fate of the *leaf* of the burnet, considered as a fodder, I wish some gentlemen, who have considerable quantities of the seed, would try its effect by way of corn for horses, &c. I cannot suppose that the cattle will dislike the seed, which will *probably* prove a warm provender.

N. B. Your printer mistakes *Skidby* for *Skidley*.

NUMBER LVI.

A List of the most remarkable Weeds, which infest the Arable and Grass Lands in England, ranged according to their Duration; with the Times of their Flowering; and Hints on the best Means of extirpating some of them.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

AS different methods are necessary in the extirpation of different weeds, and it is of some importance to know which of them are perennial, and which only annual, I have sent you a list of the most remarkable weeds which infest the arable and grass lands in England, ranged according

according to their duration. A pomp of names is carefully avoided, and those which Mr. *Hudson* has given in his *Flora Anglica* are chosen : it is a misfortune that many farmers will not know what plants are meant by some of these names ; but it is a misfortune scarcely to be avoided, since the English names of vulgar plants are so various ; altering not only with the county, but with the place, and even sometimes depending on the whim of a common labourer.

By far the greater number of annual weeds infest the arable lands : in grass lands the perennials chiefly flourish. The reason is obvious ; in the former the roots are continually destroyed by cutting ; in the latter they are made to spread by cutting or eating down the stems : perennials usually require more than a year to come to perfection ; and the seeds by which annuals are propagated, are not so readily received into the more compacted turf, as into land whose parts are constantly undergoing a separation.

The annual Weeds which infest Arable Lands and Gardens are chiefly these.

Ivy-leaved Speedwell, or small Henbit. April.

Annual Darnel-grass.

Bearded Oat-grass, Bearded wild Oats, or Haver.

Little-field Madder. May.

Cleavers, or Goose-grass. May.

Parsley-piert. May.

Pearl-wort, or Chickweed Breakstone. This small weed is very apt to infest gravel-walks ; and if it be suffered to seed, will increase prodigiously, and grow very troublesome. June.

Bastard Alkanet. May.

Small wild Bugloss. June.

Male Pimpernel. May.

Venus's Looking-glass, or coddled Corn-violet. June.

Dodder, Hell-weed, Devil's-guts, or Scald. July.

This

This is found chiefly on beans; it strangles the crop, and draws its nourishment from the plants about which it entwines itself. It infests also hops and flax.

Goosefoot of several kinds flourishes on dunghills, and is often suffered by the farmers to grow there unmolested, by which the dung is much exhausted. August.

Small Corn Parsley. August.

Fool's Parsley. This is generally allowed to be a strong poison, and is very common in gardens.

Shepherd's Needle, or Venus's Comb. June.

Common Chickweed. The pest of gardens.

Knot-grass. This plant is remarkably full of seed, and propagates itself surprisingly: it will grow any where, particularly in places that are much trodden. The sparrows, and other small birds, are very fond of its seeds. June.

Black Bindweed. June.

German Knot-grass, or Annual Knawel. August.

Purple-flowered Chickweed, or Spurrey; on sandy lands. June.

Cockle. June.

Corn Spurrey. August.

Petty-spurge. July.

Sun-spurge, or Wart-wort. These are both very common in gardens. July.

Red-poppy, or Corn-poppy. June.

Wild Larkspur. This has increased so much of late years in Cambridgeshire, as to become one of the common weeds among the corn.

Adonis Flower, Pheasant's Eye, Red Maithes, Red Morocco. Frequent in the corn-fields of Kent.

Corn Crowfoot. The seeds of this do not come forth till the second year after sowing. June.

Upright Ground-ivy.

Red Archangel, or Dead Nettle. Common in gardens.

Great Henbit.

Narrow-leaved Allheal.

Nettle-hemp, or Hemp-leaved Dead Nettle.

Red

Red Eye-bright.

Fluellin, sharp-pointed, and round-pointed.

Gold of Pleasure ; among the flax. June.

Shepherd's Purse.

White-flowered Charlock, with a jointed cod. June.

Yellow-flowered ditto.

Wild-mustard, or Charlock. May.

These three, particularly the last, are the *opprobrium* of the farmers : they who will not be at the pains to extirpate them by hand, might do well at least to run a scythe over their crops, while the weed is in flower, and before their spring-corn (for it is that which is chiefly troubled with it) is got up too high.

Fumitory. April.

Yellow Vetchling ; very common in the corn-fields about Cambridge.

Common Sow-thistle. June.

Common Groundsel.

Corn-marigold ; the pest of light lands : it is not fond of dung. In Denmark there are laws for the extirpation of this weed. June.

Common Camomile, or Corn-feverfew. June.

Stinking May-weed. June ; somewhat earlier than the last.

Blue-bottles. July.

Pansies, or Heart's Ease.

Lesier Nettle. August.

Orache, of several kinds ; along with the Goosefoot, on dunghills, and in gardens. August.

Annual Weeds in Pasture-Grounds are only the following.

Purging-flax. May.

Knot-grass. This spreads chiefly by the path sides, and where dung or rubbish has lain.

Yellow Rattle, or Cocks-comb, vulgarly Penny-grass ; in moist meadows. This keeps its ground, for the seeds are ripe at the time of cutting hay. June.

Eye-

Eye-bright ; in dry pastures.

Red Eye-bright.

Heart-trefoil, or Clover. This is always mixed with clover, and particularly with the hop-trefoil, or non-such. It is a harsher plant, full of hard, prickly seed-vessels, and therefore not a good food for cattle : it is easily known from other clovers, by its seed-vessels, and the spots upon its leaves.

Common creeping Mouse-ear. May.

Smooth-succory Hawk-weed. June.

Star-thistle ; in dry barren pastures, and by way-sides, July.

Hairy Sheep's Scabious ; on high pastures.

Biennial Weeds in Corn.

Viper's Bugloss, called in Cambridgeshire, &c. Cat's tail. It infests the corn very much every third year. July.

Mithridate-mustard, or Bastard-cress.

Common Melilot. The seeds of this ground along with wheat are known to give bread a very strong taste. June.

Spear-thistle. July. This, with many other kinds of thistles and other weeds, with downy seeds, are suffered to stand on banks, way-sides, and fallow lands, in order to serve for a constant supply of weeds. If the waste places were run over with an old scythe, this evil would soon be prevented.

Biennial Weeds in Pastures.

Wild-carrot, or Bird's nest. June.

Cow-parfnep. July.

Common-mallow. May.

Rough-succory Hawk-weed. July.

Stinking Hawk-weed. June.

Musk-thistle. July.

Wild Carline-thistle. June.

Perennial Weeds in Corn.

Field Fox-tail, or Mouse-tail-grass.

Common Wheat-grass, Dog's-grass, Quick-grass, or Couch-grass. As every piece of this most detestable

creeping weed will grow, there is no way of destroying it, but by ploughing up the ground thoroughly, picking it out, and burning it.

Common Field-scabious. August.

Small Bind-weed. This spreads its roots deep and wide; and as every piece of them will grow, it is no easy matter to eradicate this pernicious plant.

Bladder-campion, White Corn-campion, Spattling-poppy. July.

White-campion. May.

Small-bramble, or Dewberry-bush. June.

Corn-mint. August.

White-archangel, or Dead-nettle; chiefly in gardens and under hedges.

Corn Rest-harrow, or Cammock. The roots of this mat together with great strength; and are therefore very troublesome, where land is to be ploughed for corn. This property, however, makes it an excellent plant to set on sea and fen banks, to keep them firm and compact. July.

Tree Sow-thistle. August.

Way-thistle. The fallows are usually well overspread with this weed, whose downy seeds are easily spread by the wind. July.

Great Knap-weed, or Matfellow. Its roots are very stubborn and hard. July.

Corn Horse-tail.

Perennial Weeds in Pastures.

Devil's-bit. June.

Great-plantain, or Waybread. June.

Ribwort, or Ribwort-plantain. June

Yellow Ladies Bed-straw, or Cheese-rening. It is a vulgar notion, but a false one, that this herb will turn milk. The good women are fond of putting some favourite plant into their rennet, and thus attribute to it a quality which it has no right to claim. July.

Cowslips, or Pagils. April.

Round-leaved Bell-flower. August.

Lesser Throat-wort, or Canterbury-bells. July.

Meadow-saxifrage. August.

- Burnet-saxifrage. August.
 Crow-garlic. This gives milk and butter an insufferable strong taste. June.
 Broad-leaved Dock. July.
 Common-forrel. May.
 Sheep's-forrel.
 White-saxifrage, or Sengreen. May.
 Agrimony. June.
 Drop-wort. Hogs are fond of the roots. July.
 Meadow-sweet. June. Only in very moist meadows.
 Goats are very greedy of this plant, which neither horses nor kine will touch.
 Tormentil, or Septfoil. June.
 Creeping-crowfoot, or Buttercups. May.
 Bulbose-crowfoot, or Butter-cups. May.
 Upright Meadow-crowfoot. June.
 The three last, which occupy so much room in almost all meadows, are not eaten by any sort of cattle, being of a very hot and acrid nature; so that the notion of their giving butter a yellow tincture, is as false as it is vulgar.
 Pilewort, or Lesser Celandine. April.
 Meadow-rue. June.
 Bugle. May.
 Self-heal. August.
 Common Yellow Toad-flax. July.
 Common Ladies-smock, or Cuckow-flower. April.
 Crowfoot Cranesbill. June.
 Common Broom; in dry pastures. May.
 Rest-harrow, or Cammock; in barren grounds.
 Dandelion. April.
 Rough Dandelion. May.
 Yellow Devil's bit. August.
 Long-rooted Hawk-weed. May.
 Dwarf Carline-thistle. July.
 Common Coltsfoot; in watery days. March.
 Common Butter-bur; in moist meadows. March.
 Ragwort, or Seagrim. Nothing touches this plant; though a perennial, it comes up easily by hand, when young, or when the ground is moist. July.

Fleabane; in moist places. August.

Common Daisie. I do not find that any cattle willingly eat of this plant, which occupies so large a part of our pastures.

Greater Daisie, or Ox-eye. May.

Common Yarrow, or Milfoil. The roots of this creep abominably, especially where rubbish, or dung has been laid. May.

Common Knap-weed, or Matfellow. July.

Orchises of various sorts; as

Butterfly Orchis.	May.	} In moist meadows.
Male Fool-stones.	May.	
Female Fool-stones.	May.	
Male-handed Orchis.	May.	
Female-handed Orchis.	June.	
Red-handed Orchis.	June.	} In dry pastures, chiefly in chalk.
Purple late-flowering Orchis.	June.	
Little purple-flowered Orchis.	May.	
Man Orchis.	June.	
Frog Satyrion.	May.	
Triple Ladies Traces.	August.	}
Bee Orchis.	June.	

Carexes of various sorts; in low meadows and fenny grounds. These are all very harsh: they are, however, mowed to fodder cows with in winter.

Common Nettle.

Adder's Tongue; in moist meadows.

Female Fern, or Brakes; on dry barren land. It strikes its roots far and wide, and is difficult to eradicate even with the plough.

Mosses of various sorts. Old pastures are most infested with these. Ploughing is the only effectual way of destroying them.

I have added the time in which most of the foregoing plants begin to flower; because about that time it is proper they should be destroyed *. I am, &c.

P. B. C.

* We are highly obliged to this gentleman, for his ingenious and useful letter; but, we think, it would contribute much to the advantage the public may receive from it, if descriptions of the several plants, suited to common readers, were to be added to the list. R. E. O.

NUMBER LVII.

Experiments and Observations on the Sowing of Horse-Beans together with Oats.

GENTLEMEN,

IT has been a practice for many years, by some farmers in this neighbourhood, to sow beans and tares together for pulse, or corn for their horses; but I have observed that the tares overpowered or over-run the beans; and that the latter produced very little corn. I had, therefore, a mind to try the experiment of beans and oats together; as oats could not have the same effect on beans as tares: in consequence of which, the beginning of last March, I sowed two bushels of beans under furrow, and ploughed very shallow. Exactly nineteen days after, I sowed two bushels of oats on the same furrow, harrowed well in, (for the ground could not be harrowed after the beans, on account of the oats being obliged to be sown some time afterwards,) in order that the beans and oats might come fit together for harvest. The last summer, I imagine, almost every body knows to have proved a very dry one; and consequently there were no great crops of beans or oats on light hot lands, but quite the contrary. However, this experiment answered so far as to enable me to assert, that the beans and oats came fit to harvest together; and that upon a part of this, which was cooler and better land than the rest, the crop of both beans and oats were good, and free from weeds. I must beg leave, gentlemen, therefore to recommend to those, who have light sandy lands, (for this method will not answer in loams or clays) and who want beans for their horses, to try whatever small quantity of land they please, by way of experiment: and I think they will find their account in so doing. For I observed, at the time of the oats being sown, that there was an infinite number of young weeds, which were destroyed by harrowing in the oats:—that the ground was dry by being ploughed:—and that the oats grew fast, and prevented greatly (especially where the land was best).

the

the weeds from growing. In light lands, which are not so proper for beans, if beans are furrowed, hoeing two or three times is in general necessary, and pretty expensive : and after this is done, a dry summer, and hot as this last, will nevertheless produce, hardly, any crop. Now, as beans, being sown in the manner before mentioned, and oats afterwards, will actually come together for harvest, and by this method a number of weeds are destroyed by harrowing in the oats, almost three weeks after the beans are so sown, the expence of hoeing is saved, and the land covered with the beans* and oats, which prevents the sun's great heat on those sandy grounds, in some measure, in the middle of summer. The more you lime, marle, or chalk those lands, the better : and if three bushels of oats, instead of two, were sown on an acre, I should apprehend that to be better also ; as they would cover the ground more effectually, and not cost more than the expence in general of hoeing and weeding an acre of beans. If any of your readers should try the experiment, I wish them success. I purpose sowing four acres, at least, next season.

I am, GENTLEMEN,

Your most humble servant,

Nov. 1765.

The KENTISHMAN.

* The beans should be of a small kind.

NUMBER LVIII.

Observations on Turf-Ashes ; and on the Question, Whether it is best or not to lay Ground bare in Winter, by cutting off such Grass as is not eaten in Autumn?

GENTLEMEN,

RETURNING home last night, I found your two last Numbers ; and as the perusal of them occasioned some reflexions, which, I had reason to think, you would wish

wish to see on paper, I sit down to communicate them just now, lest my occupations, which threaten for some time to deprive me of leisure, should put them out of my mind.

The first thing I will do, shall be to comply with the request of one of you (in p. 130, of your present Volume) who desires I would communicate to you the *making* and *using* of turf-ashes in *Yorkshire*. This request was occasioned by my saying, in a letter to you of an old date, that the farmers in our moors have *plenty of manure* for their *meadows* by their *turf-ashes*.

Now, gentlemen, the case is this. Though the people in our moors have some *coals* and some *wood*, yet their general fuel is *turf*; that is, a paring of the surface of their moors, after having burnt down their *beath* or *ling*. These parings, made in a dry season, are set up to dry thoroughly, leaning one against another; and then, when dry, are piled or stacked in small *piles* or *rooks*, as they are called, about half a load, or a quarter of a load each, carried up exactly square to a certain height, and then drawn up gradually in a *pyramidical* manner, so as to throw off any accidental showers. In a very dry season, even the covering of these *rooks* may be carried home, and *stacked* or *housed* indiscriminately with the rest; but in a *wetter season* it is usual to separate and dry these topmost, if the weather allows, and to stack them separately, to be used on the tops of their fires, when large, as dampers. A stout labourer will in a day pale two waggon loads of these turves. The women and children can set them up to dry, and the women can rook them.

Thus the poor, who have a right to get turves on the moors, which is called, in conveyancing, a *right of turfery*, if they are careful to watch the good season, get their fuel at a *reasonable rate*; and without this convenience they would very often be in danger of being *starved*.

The ashes made by this fuel are carried out *daily*, or *once* in every *two* or *three* days, to the dunghill; and the farmer takes the opportunity of his first leisure towards the end of the year, to carry them out to his meadow land,

land, on which he sets them thicker or thinner, as he has more or less land which he apprehends to want them, and more or less of them. The first rains wash them in, and the next summer never fails to shew their good effect.

You will easily imagine, gentlemen, that as these ashes are much finer or more pulverized than those of coals, so they more easily insinuate themselves into the soil, but are in their effects *much less lasting*. However, as every year brings a considerable supply, the farmer is less concerned that they are not a lasting manure.

In our moors the farmer is so sensible of the efficacy of these ashes, that it is become a proverb among them, "The *better fire, the richer farmer*." In consequence of this principle, the farmer endeavours to procure all the ashes he can from those *householders, or cottagers*, who have no land. Hence, gentlemen, arises an happy connexion; for the poor cottager, finding the article of *leading* the chief part of the expence of his fuel, is wise enough to bargain with the farmer to lead him such a quantity of his turves, in consideration of his ashes.

I must, however, add, that many farmers lay these ashes on to their ground in the spring; and if showers follow, they will have their effect in the summer crop; though not so great, as if they had been laid on at the end of the year. It must, nevertheless, be remarked, that as he who lays on the ashes in spring, lays on what has been very lately made in the winter, and he who lays on at the latter end of the year, lays on what has been evaporated during all the summer, it is *problematical*, whether method be the better.

Many farmers, gentlemen, in the moors in this neighbourhood, having considerable tracks of heath in their farms, are allowed by their landlords to pare a part thereof every year for sale. They usually sell one waggon load of these turves, when fetched away, for five shillings, and hereby raise a considerable part of their rent, as some of them will sell one hundred loads in one year. They have a further advantage of leading many of these loads which they sell, and receive seven, eight, or ten shillings for

for every load thus led, in proportion to the way they lead them. Thus are they enabled to profit by an ox draught, which, without being abused, will carry out a great number of loads in a good season. Thus will the farmer, who takes a farm of fifty pounds *per annum*, raise a considerable part of the half-year's rent by the pay for his turves, without having expended one shilling, except in support of his draught and servants, which he must in any case have expended.

I have been thus particular, gentlemen, in my account of the making and using of turf-ashes, in obedience to the request of one of you ; and from a persuasion, that the account may be *entertaining*, and perhaps *even useful* to many who live in a country where the practice is not known.

I agree, gentlemen, with your intelligent correspondent *Mago*, (see p. 198) that “ squabbling among ourselves “ about trifles, can never advance the cause” we profess to join in, *viz.* public good ; but when you think yourselves obliged, by your *impartiality*, to admit attacks on any *principles* or *conclusions*, *experiments* or *reasonings*, which seem to your correspondents *ill-grounded*, that same *impartiality* must oblige you to afford the person attacked a fair opportunity of *defence*, which he often cannot have without exposing the *weakness*, *insolence*, and *unfairness* of the *assailant*. Many writers will never restrain their petulance from any other consideration than the fear of being *soundly drubbed*, to the just terror of *themselves* and their *brethren*. The only way to quit yourselves of *malicious* writers, (if you have *undesignedly* given them a place, and I dare say you will never *otherwise* give them a place) is to allow the *injured* an opportunity of shewing them in true colours. Gentlemen, while *curs* bark at nothing but their own *shadow*, I wish the *whip* may always *hang in sight*, to *still* them for the sake of their neighbour's quiet.

In consequence of these reflexions, gentlemen, I have seldom been better pleased than with your allowing your *most worthy* correspondent the *Englishman* from Ireland, to give an *heartly* and *well-deserved drubbing* to P. H. in No. XLIV. of your present Volume. What your able cor-

respondent the *Englishman* advances now on the subject of that letter, viz. that the *slab* of the *hoved beast* should be made *perpendicularly from the back*, with the knife's point downwards, is highly rational, and seems to close up all necessary explanation of that important subject.

I am glad, gentlemen, that the *sensible Mago* and I have fallen on the same useful subject, viz. a reform of what he calls the *five-coultered Plough*, and I the *manure Plough*. I have long since wrote to you a letter on that subject, with a drawing annexed, and have only waited for a *frank* or *private* hand to convey it, and some other pieces. We have both fallen on the improvement of *adding wheels*; but I have no forward *beam*, nor any plank. Mine is much the simpler machine; and I shall be glad, that the better of the machines may be preferred, or a still better formed from both our improvements.

The writer of No. XXI. in your present Volume, gentlemen, labours under the same *malady* as P. H. and cries out for the same *remedy*, the *oleum baculinum*. One would wonder that men, who do not appear in other respects to want *common sense*, should so palpably mistake their own *bare assertions* for *arguments*, as we find they often do. The *militant* Mr. G. B. has *generously* and *heroically* undertaken to defend the *voluminous* Mr. Mills, in an assertion which might justly be styled *strange*; if indeed Mr. G. B. be not Mr. Mills in disguise.

Mr. Mills has *solemnly*, and without any *restriction* or *qualification*, directed husbandmen *universally* to cut off of their ground the grass which is not eaten in *autumn*. I shewed this direction to be contrary to the plainest principles of vegetation, which require to give the ground in winter as much cover, and consequently warmth, as we can afford.

In proportion as ground is rich, either by *nature* or *art*, by its *situation* near the sea, navigable rivers, &c. or by *manure*, it has more warmth, and wants less cover; and in the same proportion, *common sense* will dictate a relaxation of the *general rule*; just as in the case of the *human body* with regard to *cloaths*. Farmers in the *Ile of Ely*, or *Lincolnshire*, may find, by experience, that their soil is so good, that they can afford to turn lean stock
into

into their summer-grounds to eat, at the latter end of the year, the fouler grafs which the better-fed flock disdained to meddle with, and yet have good crops in the succeeding summer. But what consequence arises hence? *Must* we, may we conclude fairly, that because the extreme goodness of the soil, in such cases, secures a good summer crop, it would not have been better to leave the cover on the ground? Or if it could be proved better to eat it off in that *particular* case, *must* we, *may* we conclude fairly hence, that it is in *any* degree *prudent*, or rather *not in the highest degree absurd*, to *cut off* the cover *indiscriminately* from *all* grounds, which is *absolutely necessary* in many to keep the ground warm, and secure an early *spring-grass*? Yet this latter *conclusion* must the sagacious Mr. G. B. *make and maintain*, from these *premises*, if he will *effectually*, out of his *abundant zeal without knowledge*, defend Mr. Mills; for the *whole substance* of what he advances, in his letter of two pages and a half, on the subject which gives it the title, is, that “the graziers in the “*Isle of Ely*, and neighbouring ones in the confines of “*Lincolnshire*, turn their lean stock to eat down the remains of summer-grass.” I say, gentlemen, this is the whole substance of what he advances; for as to his flourish, that his neighbours take their scythes and cut down the grass which the cattle will not, and cannot eat, it deserves no notice; for he tells us, that the design is to make the ground look *neater*. If the question were about a plot of ground, just before the house of some nobleman or gentleman, no body of sense would dispute about preferring the *neatness* of mowing in that case, to the *profit* arising from the not mowing. But to couple *neatness* and *advantage*, as always going together in the management of ground in general, must be such a paralogism as Mr. G. B. must be ashamed of; for it would authorize us to conclude, that it is most advantageous to lay no manure on our ground, because the *filthy look* thereof spoils the *neatness*. This is to be a *jammy* in agriculture indeed.

This *curious* husbandman, of his *gracious condescension*, informs me, that if I had turned cattle in *good plight* into ground which had *tufts* or *tussocks* of old sour grafs, they would not have touched any of them till they were pinched with hunger. Wonderful discovery, reserved to establish the fame of G. B!—And now that he is in a *liberal mood*, he *graciously*, *very graciously*, informs us . . . (mind, gentlemen, what he informs us . . .) that *truly* these tussocks stink, or are too rank!—Surprizing! And may we, Sir, take so unexpected a fact on the single authority of you, an *anonymous* writer? If you will tell us, that you are Mr. Mills, we will believe you *for once*.

But to be serious, gentlemen!—In order to shew *how extremely absurd* it must be, to cut off, for no purpose, the cover of every meadow and pasture-ground, which would keep it warm in winter, I brought an instance in point, *viz.* that the young grafs was kept warm by the old, as was evidenced hence, that a finer crop appeared in the spring or summer, where old tufts of grafs had been suffered to stand in winter, than where the grafs had been *eaten near*, in other parts of the same close, other things being equal, as the philosophers say. Now, poor Mr. G. B. is *so unfortunate*, as to turn these *tufts* or *tussocks*, as he calls them, against himself and his friends; for he truly asserts, that they are often *too rank*, or *stink*; that is, they are advancing fast to a state of *putrefaction* and *dissolution*; that is, are at present a *good cover*, and will soon be a *good manure*. Now, what does Mr. G. B. advise? Truly, to turn in lean stock. Will they eat any of these tufts, while any of the finer grafs remains? No, surely; and so himself affirms. What then must be the consequence? The lean stock will gnaw the fine grafs up, even by the roots, while their teeth will bring it up at all, and thus starve that part of the ground, and greatly damage the future crop; and then, being almost pinched to death with hunger, they will tear up the old tufts, and receive scarce any benefit from such a rotting food, and probably contract many distempers, and deprive that part of the ground too of its cover. Notable management, truly! How just a panegyric upon the graziers of the *Ile of Ely*, &c.!

This

This is the *able master of agriculture*, who gravely tells you, he is *sorry to dissent* from me, just when he is going to make the *most petulant* attack upon me! He is *modest enough*, or (to speak *truly and properly*) *affected enough*, to own, he will not DISPUTE, that is, REASON: and indeed, he is in the right not to attempt what he has not the least talent for. But what will this wonder-worker do? Why, truly, gentlemen, he will CONVICT.—CONVICT! What! evidence, jury, and judge at once! Alas! poor Mr. G. B. you have given us a full *conviction* of one thing in your letter, viz. that if you *convict* any body, it must be only on the principle, that “silence gives consent.” If any body whom you may take it into your head to *convict*, have his *tongue cut out*, or his *hands cut off*, so that your *ungrounded assertions* may go for *proofs*, you may *convict* him; but hardly otherwise. Whether you can *convict yourself*, as you boast, we shall see by your taking *patiently* this just *conviction* of your petulant attack on me.

Before I dismiss Mr. G. B. let us see once more how he wields his *dagger of lathe*. He assures you, that all I have said, “appears to be *mere theory and speculation*, “without the *least spark of practical knowledge*, save in my “own neighbourhood.” This is out-doing his own out-doings.—“*Theory*, supported only by practice, in one’s “own neighbourhood.” Where would the man have one support one’s *theory* by *practice*, but in one’s own neighbourhood? Should one *run abroad*, *purposely to neglect* what passes at home? Does not every one of your *rational correspondents* support his theory by practice in his neighbourhood? Does not this *illustrious improver*, Mr. G. B. himself support not his *theory*, but his *fancy*, his *dream*, by the practice in his neighbourhood, if we may believe him? As he has been so liberal in his instruction to me, I will amply requite him by a secret, viz. “that I have “travelled through most of the counties in *England*, and “never met with any one person who defended the practice “of cutting away the winter-grass.” Let him now,
with

with his old philosopher, remember, and apply to himself, his definition of idleness at the bottom of his letter.

You, gentlemen, will, I hope, on account of this instance, and many others, pay no regard to the *cant* against *theory* and *speculation*, which said *cant* is nothing else than bigotry in favour of *nonsensical customs*.

I am, as usual, &c. T. COMBER.

Errata in your last Number, in my letters; *larning* for *earning*, and *sower* for *sewer*.

NUMBER LIX.

The Plantation of the Great Maple recommended (commonly called the Sycamore.)

GENTLEMEN,

THE plantation of several sorts of timber has been recommended by premiums of the society of arts, and with great propriety and success, I believe. There is, however, one species of trees which is little known in general, and not much esteemed generally by such as do know it. This is what is vulgarly called the *sycamore* or *plane-tree*, but erroneously; for it is neither the one nor the other, but the *great maple*. Its *speedy growth*, and *fine shade*, are circumstances which cannot fail of recommending it to every one who sees it; and the consideration, that it grows well on almost any dry soil, may further encourage its plantation.

But then, there are many circumstances which may discourage its culture, viz. its being a white soft wood, which is hardly used by any workmen, except dish-turners: and lead-bowls being now the *fashionable ware*, it should seem that there can be little demand for the *great maple*. This tree is also very apt, when lopped, to run into knots; and when an hole is once made, it takes water and decays apace. The softness of the wood also tempts the wood-pecker, and the knotty part is of no use except for fire.

Notwithstanding all these discouragements, gentlemen, I will venture to recommend the plantation of the *great maple*,

maple, from a fact which I can aver on my own knowledge, so far as regards the sale, and on authentic records, so far as the planting is concerned.

About the year 1660, my great grandfather, *William Thornton*, of this place, Esq; brought from *Hipswell*, near *Richmond*, in *Yorkshire*, (the jointure-seat of his mother-in-law, my great great grandmother, lady *Wandesforde*) some *keys*, or *chats*, of the *great maple*, and set them here, in consequence of which we had, in a small spot of ground, three rows of trees, twenty-six in number; which, when young, were many of them mismanaged, by injudicious lopping, &c. Notwithstanding these disadvantages, one of the extreme trees, having suffered in a storm, was sold, about twenty years ago, to *Thomas Myres*, of *Helmley Black Moor*, dish-turner, for three pounds. Three years ago, ten more, not picked, were sold to the same person for twenty-six pounds; and I have just now sold to the same person the fifteen remaining for thirty-four pounds. So that the whole number of twenty-six trees were sold for sixty-three pounds; an instance perhaps not to be paralleled.

It deserves observation, gentlemen, that one tree in the second bargain, was allowed by the buyer to contain three tons of wood; and if it had been preserved from rain, and taken before it past its best, was thought to have been worth three times the value set on it when sold. One of the trees in the present bargain is valued at about four pounds ten shillings. So that surely, gentlemen, here is abundant encouragement for planting the great maple.

We have the *speckled large maple* introduced in the *North* of late years. *Francis Chalmley*, of *Brandisby* in this neighbourhood, Esq; has set considerable numbers in the hedge-rows of his new inclosures: but I cannot learn whether or no this species grows as speedily as the other, and to as great a bulk. This is a material inquiry; for no man of sense would think a *speckled leaf* a recompence for want of bulk in the tree, unless in shrubberies, &c.

I must, gentlemen, acquaint you with a strange account of a *phenomenon* in *natural history*; which, if true, admits not an easy solution.

The

The tree which I mentioned above, as being valued at about 4 *l.* 10 *s.* had a bole of some yards, and then divided into three considerable boughs. The buyer, well knowing that this wood is very apt to *shake* and be *sadly* damaged in the falls, sent up a workman to take off one of these main boughs, that the fall might be more easy. The workman sent up, who is my neighbour, and a man of veracity, for any thing I know to the contrary, affirms, that when he came up to the cleft of the tree, he spied, in a few handfuls of dry earth in the cleft, which had been brought thither by the winds, a mole, rooting as in common earth; and that he cut off her head with his ax, and threw her down: and both the wood-buyer and his son affirm that they saw her fall thence. It is to me, gentlemen, utterly unaccountable, how this mole could come in the cleft of the tree, at several yards distance from the ground. I cannot conceive, that she could, at this season, survive so long above ground as was necessary to mount that bole, even if she found no unnatural difficulty in climbing up the rough bark with her soft belly.

I cannot conceive that she could subsist any time in those few handfuls of dry earth which were in the cleft of the tree. I cannot conceive it probable, that any bird of prey should raise her from the ground, and then drop her in the cleft. Nor can I more easily conceive, that the workman should have any motive to carry up the mole with him, and drop her there, to create a wonder; especially as the catching a live mole was a thing out of his way. I wish, gentlemen, that some of your correspondents, and especially such as correspond with the *Royal Society*, would give their sentiments on the subject, by your channel, to the public, and particularly,

GENTLEMEN,

East-Newton,
July 20, 1765.

Your old correspondent,
THOMAS COMBER.

Museum Rusticum, &c.

For DECEMBER, 1765.

VOLUME the FIFTH.

NUMBER LX.

Continuation of Mr. John-Wynne Baker's Report to the DUBLIN SOCIETY: Containing Experiments and Observations on the comparative Ripening of Spring and Common Wheat; the comparative Advantage of sowing Barley in the Broad-cast or Drill Ways; French Barley; Burnet; Lucerne; Red Clover; the native Strawberry Trefoil; and the Means of killing the Red Worm, which frequently destroys young Corn.

Experiments on the comparative Ripening of Spring and Common Wheat.

SOME little time after receiving the instructions I was honoured with from the Society, I was desired by the committee, then sitting to settle the premiums for the succeeding year, to make a comparative experiment between spring and common wheat.

The purpose of this experiment was to discover, whether common wheat would not ripen when sown late in the spring, as well as spring wheat.

VOL. V. No. 27.

T t

Accord-

Accordingly, on the twenty-eighth day of March, I sowed two perches of each sort of wheat in my garden, in drills three feet asunder, at the rate of five stone to an acre. I had but two pounds of spring wheat, otherwise I should have extended the experiment.

The common wheat came up well, but the spring wheat came up very thin in the drills, which, for some time, I apprehended was owing to some fault in the seed; but the case was otherwise, as appeared afterwards from a second sowing in another place: add to this, that in a few days I discovered mice had eaten great part of the seed; however, some little of it escaped, and planted greatly, as did the common wheat.

As a substitute for the horse-hoe, which could not be introduced in these small experiments, I used the spade, and the plants grew to admiration.

The fatality, which attends all small experiments in the corn tribe, followed these: for I was obliged to cut the spring wheat before it was ripe, the birds, in defiance of all protection, having devoured most of it; however, it would have ripened completely, and, as a proof of this assertion, I have a few ears, which I selected from the rest, which are very fine.

It may be proper to observe, that the spring wheat was more exposed to the ravages of birds than the other, as the common wheat I sowed was bearded, which is always a great, though not a perfect, protection to it from birds.

The common wheat met with a distemper which was quite as fatal to it, as the mice and birds were to the other: this was the rust, or mildew. Before this disease came upon it, it was as fine corn as ever I saw, but it never ripened; although in appearance the ears were very fine.

This disease attacking this corn and sparing the other, I am inclined to attribute to this circumstance, *viz.* that this was very thick and strong; whereas the other was very thin, from the accident before mentioned: perhaps, had it been as thick, it might have shared the same fate.

So

So that I think these experiments are not by any means conclusive, as to the ripening of either of these species of wheat, when sown late in the spring.

I sowed another plot of ground, as was before mentioned, on the fourth of May with spring wheat, which came up well, grew very strong, and formed very fine ears in appearance, but never ripened.

On the twenty-ninth of April, I sowed an acre of very good ground with common wheat, which I steeped beforehand in putrid water; it came up in eight days, but made no figure till June; it formed small ears, but produced no grain at all.

So far we have two conclusive experiments that spring wheat will not ripen when sown the beginning of May; and that common wheat will not ripen when sown the latter end of April.

Notwithstanding that our question is not answered by the two first experiments; yet the disease attending the common wheat has furnished some observations with respect to the mildew, or rust, upon corn and other plants, which tend principally to confirm those made by the ingenious Mr. Tillet, director of the Mint at Troys, and seem to contradict most of our English writers on this disease; many of whom seem to have implicitly followed others, who, I am afraid, have undertaken to account for, and furnish remedies against, a disease, which perhaps they had never seen.

Various are the opinions, and many of them contradictory in themselves: but, upon the whole, candour obliges me to own myself as much at a loss to determine with certainty the cause of this disease, as, I find, the many writers are, who have thought themselves perfect masters of it. Even by reading six pompous pages, which I have gone over many times, I should scarcely know the disease, so faint is the description; but it will ever be known by the greatest strangers to country affairs under the French name, which indeed is as truly descriptive as it is laconic, by them it is called *rouille*, or rust. By the Romans it seems to have been called *rubigo*.

I shall omit to give my observations upon this disease at present, as it would oblige me to quote many tedious passages from the books; and where there is a contrariety of opinions, although without evidence: yet, a little man, with a few facts only to support a new theory, would stand a chance of making but a poor figure.

At present I join in opinion with Mr. Tillet, and Mr. Reneaume; who seem to think that the extravasated juices of the plants, operated upon, and condensed, by the acrimony of the air, I should rather say incrusted, are the occasion of it. To this I shall only add, that I am at present of opinion, that the lacerated parts of the plants giving passage to, or rather changing the course of, the juices before mentioned (which are the nutriment and life of the plants) to the diminution, and loss, of the vegetable food to the nobler parts, is the true cause of the plants failing in their produce: but, I repeat it, I attempt not here to account how, and from what cause, those lacerations, which I believe to be the basis of the disease, happen.

The comparative experiment between spring and common wheat, I think, should be repeated, as the discovery thereby sought for tends to a public benefit: but it should be in a larger way, and in an open exposure.

A circumstance has recurred to my memory, which had escaped my attention from the time it happened, till since I entered upon this subject.

Last spring a poor neighbour of mine told me he had lost the season for sowing his wheat, for want of money to buy seed, but that, if he could get a barrel of Poland wheat, (as he called it) which was the white cone, he would then sow his ground: accordingly he obtained the seed, and did sow it; but I understand, upon enquiry, that it produced not a good crop. He sowed it some time about the beginning of February.

And yet I am informed there is a gentleman in Scotland, who makes it his constant practice to sow his wheat in the spring by choice; and that he intends to publish a recommendation of that practice.

The

The latest I ever sowed any with success was the thirtieth of December; but that was only a small experiment once in England.

A noble lord, who is a member of the society, informs me, that he has sown red lammas wheat twice in March, old stile, with great success, in a piece of ground which had been old gardens, and that the produce was about ten barrels an acre.

The first time on the seventh of March.

The second time, his lordship says, he sowed the like seed on the ninth of March, new stile, upon turnep ground; and that the produce was computed to be fourteen barrels an acre.

His lordship informs me, the only difference he observed between that and the October wheat, was, that the wheat sown in the spring, ripened about fourteen days later than that sown in October.

His lordship has been so kind as to order his steward to repeat this experiment this year, and has condescended to promise me a report of the exact produce, time of sowing, and condition of the land; which, under his permission, will appear in my next year's report.

Comparative Trial of Broad-cast and Drilled Barley.

The next, and last article, which I had the honour to receive instructions from the Society to try experiments upon, was barley.

For this purpose I had not a piece of ground in such order, either as to its quality or tilth, as I could have wished, by many degrees; the best I had, having been a clover lay, broke for fallow in August, 1763; which lay all the succeeding winter, certainly very much to its benefit.

This field was ploughed once again, in the spring, before I received any instructions from the society; and soon after once more, for the experiments on barley.

Thus it had the benefit of a winter fallow and three ploughings; besides that of being harrowed after the second ploughing.

Be it noted, that at the third ploughing, one acre of this field was thrown into ridges of five feet breadth, in the same manner as those already described for the turneps.

The lateness of my instructions, added to many unavoidable impediments, prevented my sowing this ground till the seventeenth, eighteenth, and nineteenth of May; which I found was by much too late; however, on the seventeenth and eighteenth, I sowed six acres, in the common or broad-cast way, with one barrel of seed to each acre, and harrowed it in; and on the nineteenth, I sowed the one acre before mentioned, with the drill plough, two drills, ten inches asunder, on the middle of each ridge, with four stone and a half of seed to the acre.

The difficulties which I had to encounter afterwards, were the crows and weeds. The crows, at this season of the year, are very bold, from the great scarcity of food there then is for them; and they did considerable damage to the crops, particularly that in drills; for where they pulled up the corn, there were no neighbouring plants to extend their branches and roots to occupy the spaces, as there was in the broad-cast way: yet the damage would have been much more, had I not kept a man with a gun constantly in the field.

The winter fallow greatly meliorated and improved the ground, but did not destroy the weeds, as the addition of a summer fallow, for which I intended this land, would have done. Under these circumstances, I was greatly distressed with thistles in both the crops; but in the drills more than the other; the horse-hoeing giving every fibre of the roots fresh nourishment, which added new vigour to their growth, although I was frequently hand-weeding them from the barley.

On the second of July, I horse-hoed the drilled barley for the first time, by taking off each side of every ridge as close to the plants as could be.

This was a total destruction to all weeds on the outsides of every row of barley, but the internal intervals I was obliged to weed by hand. On the twelfth of July I

horse-hoed it again, by turning back a furrow to each side of every ridge. The vigour which this hoeing gave the plants afforded me great pleasure. On the first of September I gave it the last hoeing, which was no more than to throw the remainder of the mould out of the furrows up to the plants; which brought the ridges into their original form, and left the furrows fair and clean.

I have often heard great accounts of the extraordinary produce of French barley; and, after waiting a considerable time, acquired my intended importation of a little of it: with this I sowed five of the ridges of the drilled acre, on the nineteenth of May.

The weather being very dry for some time after these crops were sown, they both came up late: upon their approaching to maturity, they looked tolerably well; but, upon closely examining them, they were not so strong and thick as I have had, and have often seen: the ears were short, and the grains were small.

The broad-cast was thin in many places; and the drills failed, in some places a foot, and in others a yard: this last must have arisen from the crows, as we cannot err in dropping the seed regularly with the drill-plough, when once it is set to work. Perhaps in the broad-cast it might be sown a little thinner in one place than in another. Add to this, that some plants, in both the experiments, were cut off by the red worm; and they would have suffered much more, had we not on the twenty-third of June had very fine rain, which stopped the progress of these destructive insects, as I find rain always does, provided it is sufficient to penetrate the ground.

From the time of sowing, to the twenty-third of June, we had dry weather, except that for seven of the intervening days we had a few light showers; which were of no use. This dry season was much against these experiments.

The land in which these crops were sown, is upon a lime-stone quarry, in some degree inclinable to a loam, though not sufficiently so to prevent its incrusting by dry weather:

weather: it is tolerable good ground in nature, very proper for wheat, but not so fit for barley as I could have wished, and without manuring would not bring turneps to any degree of perfection, I having sown some in the same field last June, to try the quality of the land: this is a good criterion, by which to try ground for barley; and perhaps from thence has arisen the custom of barley following turneps, which is an unexceptionable good practice; for where land will bring a good crop of turneps, a plentiful crop of barley may be expected, provided the season be favourable.

It should be observed, that the land for these experiments was not manured at all.

On the third of October, I began to reap these crops, a very late season; but that must be charged to the late sowing, and dry weather, which followed that.

The six acres of broad-cast produced fifty-four barrels, seven stone, and four pounds of saleable corn, which is at the rate of nine barrels, one stone, and three pounds for every acre.

The drilled acre produced of the French and common barley together, eight barrels, two stone, and four pounds, which is less than the broad-cast by fourteen stone and thirteen pounds.

Thus we see, upon the face of the experiments, that the produce of the broad-cast is superior to the drilled by near a barrel; but out of that we are to deduct the original saving of seed at the time of sowing the drilled acre, which was eleven stone and seven pounds, which brings the produce near to an equality with an acre of the broad-cast crop.

	B. S. P.		
One acre of the broad-cast barley produced	9	1	3
One acre of the drilled produced	— 8	2	4
In favour of the broad-cast	0	14	13
Deduct for seed saved in sowing the drilled	0	11	7
Still in favour of the broad-cast	0	3	6

Hence

— Hence we see, that in fact the broad-cast produced only three stone and six pounds more than the drilled.

However, neither of the crops are what they would have been, had they been sown in proper ground, and in due season; and therefore I look upon neither of the experiments as conclusive by any means, as to which is the preferable method of sowing barley.

One circumstance I should not omit to mention, which is in favour of the drilled crop, *viz.* That the land, after taking the crop off, was in a much finer state for wheat, or any other crop, than it was at the time of sowing the barley*; whereas the ground upon which the broad-cast was sown, was by many degrees worse. It is true, the horse-hoeing is something to be added to the account of expence, which was four shillings and four-pence, for men's hire, exclusive of two horses; but that will be amply repaid by the succeeding crop. To this may be added, that at least half that expence was saved in the difference of reaping the drilled acre, and an acre of the broad-cast.

The French barley did by no means answer my expectations; the ear was shorter considerably than the other, but indeed the grains stand much closer together: it is very flat in the ear, and is good corn. Perhaps it would have succeeded better, had it been sown earlier, and on rich land.

Some of the drilled and broad-cast barley was smutted; a distemper to which all the bread-corns are liable; but, in truth, the cause of it seems to have baffled the enquiries of all naturalists who have attempted to examine into it; and although many persons have wrote upon it, and almost every one thinks his theory conclusive and instructive, yet I have generally found them mistaken.

Various motives, superstition, avarice, the pleasure of writing, or the spirit of contradiction, have influenced

* The ground upon which the broad-cast barley grew, is now, the twenty-fifth of July, under oats, and the acre which was drilled is under wheat, the excellent appearance of which I attribute to the horse-hoeing the crop of drilled barley.

the sentiments of many, without having that due regard to the honest purpose of writing, which every writer should observe; and, in truth, they seem to be as much unacquainted with the real cause of the disease, as I candidly profess myself to be; I wish to be understood, to mean with any degree of certainty, for I am not without my theory, as to the causes and remedy of this disease, as well as other persons, but I disown the motives which have manifestly influenced the sentiments of many of the writers whom I have read.

The most candid, least positive and superstitious, manifestly enquiring after the truth, are the modern French writers, whose disinterested labours, and ingenious observations in husbandry, have more merit than all the six score volumes I have before me, and do no less honour to their country than to themselves. Yet, in almost every author, something is to be found worthy of praise; but that is too often shaded by their pretensions to too much. I would be understood not to include Mr. Tull and Dr. Home in the bulk of writers; their labours are well entitled to the attention and praises of every ingenious man.

I shall probably in some future paper trouble the Society and the public with my ideas on this distemper, which can be founded upon conjectures only; but by comparing them with the observations of the most ingenious men on this subject, I think they carry a complexion of probability: but, from an abhorrence of positiveness, I wish always to preserve a diffidence, which I hope will protect me from censure, in a subject which can be discoursed upon only on principles founded on theory and conjecture.

Experiments on Burnet.

Burnet has been lately introduced in England, as an artificial pasture for cattle in the winter; and I find, by the *Museum Rusticum*, has very much engaged the attention of the public.

It is a native both of England and Ireland*; there are many species of it, which, now it is likely to be introduced as a winter pasture for cattle, is the foundation of disputes amongst the present writers, respecting the distinct species cultivated by Mr. Rocque; but, upon the whole, it seems to be the great meadow burnet. Most of the other species, according to Miller, are exoticks.

A member of the Society, who had purchased some of the seed of Mr. Rocque, did me the favour to give me a pound of it last April, part of which I sowed in the following manner, on the first day of last May.

Experiments.

No.

11. One perch in the broad-cast, or common way of sowing.
12. One perch in drills, one foot asunder.
13. One perch in drills, two feet asunder.
14. One perch in drills, three feet asunder.
22. Sown on the fifteenth of June, one perch sown in drills, three feet asunder.

In about fifteen days after sowing, the plants began to appear, each throwing up two small lobes or leaves, rather round.

On the twenty-fifth of August, some of the branches began to blossom, some of them red, and some rather of a yellow white.

From Mr. Rocque's account of the plant, I expected to have saved some seed from it, but in that I was disappointed; though there did form a little, but the quantity was so small, that it was not worth attention. He says it forms seed the first year: perhaps the season was

* I saw many native plants last summer, which were found in Rathfarnham park; and the root of one of them, which was at least two feet long, over and above a long piece, which plainly appeared to have been broken off by the workman in the digging it up.

too wet and cold for it. I had also an objection to the cutting of it, as I was very desirous to see how it would stand the winter, when grown as mine was.

All the care I bestowed upon the broad-cast, was to pull up any weeds that grew high amongst it; and the intervals between the drills I dug with a spade, as a substitute for the horse-hoe, which could not be introduced in such small experiments.

All the plants grew very well, and are now, the twenty second day of February, very fine green herbage.

I find the broad-cast is a little yellow in the lower fibres; the one-foot drills the same, only in a less degree; the two-feet drills are still less affected, but the three-feet drills scarce at all, and the plants are very green, and stronger than any of the preceding.

This seems to shew that single drills, with three-feet intervals, is the best culture for it; but Mr. Rocque says, as I am informed, it should not be sown in drills; urging, that in that position it runs upon the ground, and does not rise perpendicularly; however, I do not find that to be the case so much as I expected from his report. The plant is naturally very bushy, and throws out an infinity of branches and leaves, which naturally keeps the lower ones down. Certain it is, that my three-feet drills are much the best; for the broad-cast is lodged, and is much closer to the ground than the drilled, and therefore retains the wet more, which accounts for its being injured in the colour. Notwithstanding this, I shall not venture to determine, whether in drills or broad-cast be the best culture for it.

That which was sown in June is not so high, nor so strong, as the three-feet drills first sown, but is near equal to the two-feet drills, and is superior to either of the other two experiments.

I think it a grass which merits great attention, for it has preserved its verdure all the winter, and has not received the least injury from the frost and snow we have lately had, which was pretty severe for the time it lasted.

A few mornings since, I walked out pretty early to examine it, when the frost was hard, and the burnet covered with snow; with a broom I beat off the snow, and the plants were as erect, and retained their verdure as perfectly as in September last. Hence I have not a doubt but it will be a great acquisition to the farmer and grazier, when it comes into general use.

I have this day, *i. e.* the twenty-second of February, cut some of it, which I gave to my sheep, black cattle, and horses, and they all eat very eagerly of it. I shall immediately send to England for the seed of it, and shall extend my experiments upon it this year, and hope in my next year's report to give a pretty full account of it.

Experiments on Lucerne.

The inestimable value of this plant has been so much spoken of by all the ablest writers on husbandry, that it is quite unnecessary for me to say any thing in its commendation.

Here follow my Experiments upon it this Year.

No.

15. Sown in drills, three feet asunder.
16. Sown in drills, two feet asunder.
17. Sown in drills, one foot asunder.
18. Sown in the common, or broad-cast way.

I sowed the seed for these experiments on the first of May, but the middle of April would have been a more proper season.

The lucerne began to appear on the eighth day: in its first appearance, it has two very small leaves of an oval form.

These experiments were treated in the same manner as the burnet.

On the sixteenth of August, I cut the lucerne of each experiment, and the produce of green fodder was as follows:

Number

Number 15. *i. e.* the three-feet drills, produced off one perch, thirty-one pounds and a quarter.

Number 16. *i. e.* the two-feet drills, produced off one perch, forty-four pounds and a half.

Number 17. *i. e.* the one-foot drills, produced off one perch, forty-three pounds.

Number 18. *i. e.* the broad-cast, produced off one perch, fifty-nine pounds.

Upon the face of these experiments, the broad-cast has the greatest produce. Above the three-feet drills twenty-seven pounds and three quarters; above the two-feet drills, fourteen pounds and a half; and above the one-foot drills sixteen pounds.

Hence it may be concluded by persons not acquainted with the nature and culture of this plant, that the broad-cast sowing is to be preferred, as yielding the greater produce, but I think that conclusion should not be too hastily drawn, for the following reasons.

These crops are all from the first cutting after sowing the seed, and therefore the lucerne in the broad-cast was then as good, or probably better, than it will ever be again in any succeeding crop, the ground being looser, and fewer weeds in it, than there ever can be hereafter; for the natural grass is already rising in it, although it was managed in the way practised by Mr. Rocque; which is to harrow, or rake the ground after cutting the lucerne. Another reason is, that for the first year the plants are in their infancy; but in three years I apprehend the drills will more than treble their produce: whereas, at that time, I should fear the broad-cast would be quite or near destroyed by the natural grass. In other words, as fast as the drilled crops improve, I do conceive the broad-cast will diminish.

The culture of lucerne in drills, with intervals of only one foot, I find is no better than the broad-cast, as there is no such thing as horse-hoeing between the rows, and where the crop should be large, digging would be too expensive.

But

But upon the comparative experiment, between the two and three feet intervals, I confess I cannot so readily pronounce: the two feet produce the most, by thirteen pounds and a quarter; whether that distance will continue to do so, I cannot say: it may happen that when the roots become large, which is the properest time to ascertain the fact, that the three-feet drills may have the greater produce; but time alone can determine this point, which really is very material to know.

Second Set of Experiments on Lucerne.

These experiments were calculated to discover how far the roots of this plant would bear being wounded, as in the culture of lucerne practised by Mr. Rocque: I do conceive many of the roots must be injured, to the manifest diminution of the crop.

In April, 1763, I sowed a little lucerne in my garden. May the first, 1764, I treated some of the plants in the following manner, after thinning of them in the row, by taking all others from them, and leaving the plants single, and about two feet asunder.

Numb. 1. The root of this plant I split from the crown of it downwards, for about an inch.

Numb. 2. The root of this plant was split first in the same direction as the former, and then I split it transversely, for about an inch downwards.

Numb. 3. The root of this plant I cut a slice off one side, about an inch long, just below the crown of the root.

Numb. 4. This plant I cut the whole crown of the root off.

Numb. 5. This plant I split the root of, in the same manner as Numb. 1. and then cut about an inch and a half off one side.

After wounding these plants, I dug the earth round them, in order to feed the fibrous roots to the nourishment of the plants.

They

They never afterwards made any figure. Towards September, Numb. 1, 2, and 3, threw out a few weak stems, not worth notice; but Numb. 4, and 5, never grew afterwards.

These experiments I mean to repeat in a greater number, and that for two or three years together, before I shall venture to draw positive conclusions from them: but I think these seem to prove, that Mr. Rocque's method is not to be preferred so much beyond Tull's, Duhamel's, and M. de Chatavieux's, as his advocates would insinuate*. But the fair trial between his method and the drill, will be to experiment carefully upon them for four or five years together; my experiments in wounding the plants, being only calculated to support theory by facts; for my notion of the consequences which must happen from his culture, is no more than theory.

Till I made this set of experiments, I confess I never was sensible of the texture and firmness of lucerne-roots, which are really very hard to cut, and not much unlike a dried stick, which I must confess seems to favour Mr. Rocque's method, so far as relates to my apprehension of the plants being wounded by his instruments, which, from the hardness of the roots, cannot wound them in the manner I did mine with a knife. And as my pursuits tend only to discover the truth in matters of husbandry, for Mr. Rocque's honour, and my own credit, I could not omit to communicate this remark, as I hope the reader will believe I am endeavouring to ascertain the best culture for lucerne, and not writing to lessen Mr. Rocque or his system: every man acting in a private capacity, has a right to adopt such as he pleases; but I, who am acting in a great measure for the public, think myself bound to be conscientiously exact in my scrutiny of every system, which I shall comparatively experiment upon. If I am mistaken in the culture of lucerne, I have the satisfaction of considering some of the greatest men, who have ever wrote upon the subject, are no less mistaken than I am.

* See *Museum Rusticum*, Numb. LXXXI. fol. 339. Vol. I.

Notwithstanding all that has been said by many writers on lucerne, as to its tap-roots, yet I find it has many lateral ones, and it is only a few of the plants that send down but one tap-root, but an infinite number in all shapes and directions. At a year old, I find the healthy ones are from ten to eighteen inches long; I preserve them of that age now by me, and intend every year to take them up, in order to have them of all ages, the better to see their progress from year to year.

Upon the first of last May, some of my lucerne, which was sown the year before, was eighteen inches high; but let it be observed, that it had the benefit of a south aspect, aided by the reflection of a fruit wall. This induces me to believe, that a declivity with a south aspect, will be the most advantageous situation for this plant, in this country; for, although lucerne will live in the severest winters, yet it flourishes best under the influence of a warm sun; the only blessing we seem to want in this country.

In the summer months I observe, in a good soil, and under proper culture, it grows about an inch in twenty-four hours; sometimes I have known it grow an inch and a half in the same time.

Third Set of Experiments on Lucerne.

The transplanting lucerne seems to have been first thought of by the ingenious and never-sufficiently to be praised M. de Chateaufieux, whose reasons for every new attempt are founded upon such solid and rational principles, that they have generally succeeded to his expectations. This gentleman says, plants of two or three years old may be planted equally well with those of one year old.

My plants last April were all one year old, which, upon taking up for the purpose of transplanting, I found differed very much in their size, which induced me to divide them into three parcels, *i. e.* the smallest, middling, and largest. These I transplanted in the following manner, six inches asunder in the rows, and the rows three feet.

- Numb. 1. Forty of the smallest plants, with their tap or leading roots cut off.
- Numb. 2. Forty of the middling plants, with their tap or leading roots cut off.
- Numb. 3. Forty of the largest plants, with their tap or leading roots cut off.
- Numb. 4. Forty of the middling plants, without cutting their roots.
- Numb. 5. Forty of the largest plants, without cutting their roots.
- Numb. 6. Forty of the smallest plants, without cutting their roots.

These six rows of plants were put down the twenty-eighth day of April. I watered them at the time of putting down, and once afterwards.

Very few of them died; so that the different sizes and methods seem to answer equally well the first season.

I intended to have cut the produce of each experiment for weighing; but a few days before that was to be done, my horses got into the place where it grew, and eat some of it, which disappointed my purpose. From the appearance of the experiments respectively, there would have been very little, if any difference in the produce; but a third and fourth year's crops will ascertain how far cutting off the tap-roots will benefit the plants, and how far transplanting is preferable to sowing. Be it noted, that the transplanted roots make no great figure the first year.

In order to ascertain, with some degree of certainty, how far lucerne may be worth the farmer's attention, I last summer made an experiment with an horse, to discover how much he would eat, which being known, we can, from the first set of experiments, pretty exactly tell how many horses an acre of lucerne will maintain during the summer months. The horse I chose for this purpose is a very large one; he had been ploughing from seven o'clock in the morning till seven in the evening, during
which

which time I forbid his having any thing to eat. When he was taken out of the plow, I ordered him into a stable by himself, where I had provided for him fifty-six pounds of lucerne, without any other food for that night, of which he had eat by next morning, forty-nine pounds; a quantity, which I own surprized me.

Lucerne will in this country, in favourable seasons, mow four times in a summer after the first year, and we may safely calculate, that at every cutting it will yield half an hundred weight upon each perch, which at the four cuttings is two hundred weight upon a perch in the season, or sixteen tons upon an acre, *i. e.* thirty-five thousand eight hundred and forty pounds. This is a low calculation; but at this rate, suppose five horses to be allowed forty-nine pounds every twenty-four hours, which is two hundred and forty-five pounds, in that case an acre will maintain them one hundred and forty-six days, which is twenty weeks and six days. No man will contend for it, I believe, that any natural pasture will do any such thing. Add to this profit, the circumstance of making dung all the summer; an object, I am sorry to observe, not sufficiently attended to in this country, amongst the common farmers; if they can make a little for their potatoes, they seem to think of no more.

Lucerne should never be sown upon wet or spungy ground, but upon dry rich land, and must always be kept free from weeds.

I sowed some last April in drills, upon ground not six inches deep, above a lime-stone quarry, and it grew very luxuriantly, but the soil is very good.

Turneps are the best preparation of ground that I know of for lucerne, particularly if they be raised in drills, in the manner before represented.

My lucerne in the broad-cast and one-foot drills, was infected with the rust or mildew, during its growth; this seems to be an objection to the sowing of it with such narrow intervals, or in the broad-cast way, since the two-feet and three-feet drills were in the same place, and they were not at all infected with this disease.

Red Clover.

This is a grass of very general use, and will grow upon almost any ground, except that which is wet; but the abundance of the crop depends upon the quality of the land, and the season.

For the first time in my life, I sowed a little last year in drills, three feet asunder, on the first day of May, without any corn with it. In August following, I cut one perch of it, and the produce green, weighed one hundred weight and a quarter, *i. e.* one hundred and forty pounds; a quantity, which I confess surprized me; but producing such an abundance the first year of sowing, and that at one cutting; what must be the produce the second and third years, upon good land and in favourable seasons, when it will cut at least twice, if not three times in a summer? I am willing to believe, at least, three hundred weight upon a perch, which would be twenty-four tons upon an acre.—If so, lucerne I am afraid will never come up to it; but this opens a field for experiments, not only for an improvement in the culture of clover, but also for comparative ones between that and lucerne.

Lest any one should be induced, from what I have said, to expect abundant crops of clover by mowing, I beg leave to premise; that when it is sown upon poor land, with a view to improve it, the clover should never be mowed. But where it is intended to be made into hay, it must always be sown upon good dry land; in which case it will be very profitable, if the summer be not too dry.

The native Strawberry Trefoil.

I come now to speak of a plant, which, from what I did with it last year, seems to claim very serious attention. The first time I ever took notice of it, was in the county of Meath, upon a bank of lime-stone gravel: this induced me to look more carefully after it; and after spending a
great

great deal of my time, I collected about a quarter of a pound of the seed, concluding that a plant, which shews such natural luxuriance in its wild state, must make a great figure under a culture equal to its own bounty.

I observe where it is crowded by common grass, it is in no proportion equal to what it is, where a plant happens to be alone.

This grass, or rather permit me to call it acquisition, I found in my searches after other grasses, of which I have made a pretty good collection in their seeds, and shall in due time make my experiments upon them.

The plant now before us is a trefoil, which I find in Miller's Gardener's dictionary, being one of the twenty-five sorts he describes, and is by him called, No. 5. *Trifolium fragiferum*, or Strawberry trefoil.

Miller says it is a native of England; what I have before said, proves it also to be a native of Ireland. He says it is often preserved in botanic gardens for variety.

The blossom, or flower of it, very much resembles a strawberry, only that it is much less, and from thence takes its name of strawberry trefoil.

The seed before-mentioned, I collected in 1763, and on the first of last May I sowed one perch of ground with it in drills three feet asunder, which came up in about eight days. It grew very fast, till at last it covered the whole ground, and appeared to have been sown in the promiscuous way.

I intended to have let it stand, to see if it would ripen the seed (which I believe it would not have done the first year) but the horses which got into the lucerne, as before-mentioned, also injured this. Provoked at its being disfigured, I ordered it to be cut; till then I had no conception of its quantity, the mower could scarcely turn it with his scythe, it was so strong, heavy, and so much entangled.

The produce of this single perch green, was one hundred weight and three quarters, *i. e.* one hundred and ninety-six pounds; a quantity, which I think very great.

I have

I have this year collected about three quarters of a pound more of the seed.

The ground I sowed it upon was very well reduced, and manured with dung.

I flatter myself it will mow twice the second year, but how long it will grow I cannot yet tell.

I had a natural plant which sprung up in my orchard last summer, which some worthy members of the Society saw measured, from the extreme point of one branch to the extreme point of the opposite one, seven feet. But when it is sown together, the branches are so entangled, that it is hard to measure them.

If any gentleman, into whose hands this report may fall, should have this plant abound upon his land, I shall think myself highly obliged to him, if he will order the poor women of his neighbourhood to collect the seed, and for their trouble I will give them a guinea a pound for five pounds, provided any gentleman, who may be so indulgent as to take this trouble upon him, will insure its not being mixed with other seeds. The seed to be sent to Mr. George Faulkner, in Dublin, where the money will be paid upon the above conditions.

I had a variety of other small experiments depending last year, but the accident before-mentioned, of my horses getting amongst them, disappointed my enquiries.

Some Account of the Red-worm: an Insect which is very destructive to young Corn. With some probable Methods to destroy it.

I have often heard of the havock which red worms make in young wheat, barley, and oats; and in some few writers upon husbandry, have read of them; but never saw them till May, 1764; when, to my great mortification, in a few days, they destroyed, almost totally, nine acres of my wheat; I say almost totally, because I did not reap above half a barrel an acre. This misfortune induced me, to propose to the consideration of the Dublin Society, whether the offer of a premium might not probably

bably produce a discovery of some effectual method for destroying so injurious an insect; to the infinite advantage of the public: and the Society were pleased to offer a premium accordingly.

I now have the honour to lay before them, what has occurred to me upon that subject.

The most ingenious M. de Chateauvieux speaks of an insect, which is certainly the same kind, if it be not the very insect which I have now under consideration. This gentleman, after saying, "Our wheat, in the month of May, 1755, sustained a loss, which even that cultivated according to the new husbandry did not escape *," describes the worm thus: "We found in it many little white worms, which afterwards became of a chestnut colour. They post themselves between the blades, and eat the stems. They are usually found between the first joint and the roots; every stalk, which they attacked, grew no more, but became yellow, and withered. The same misfortune happened to us in the year 1732. The insects appeared about the middle of May, and made such havock, that the crops were almost destroyed."

It perhaps might be expected, that this great man should have made the very enquiry which we are now upon, as the loss appears to have been very great in Geneva, at the two periods which he mentions: but when we consider, how much the high office, which he held in the city and republic of Geneva †, must have engaged his attention; it is rather astonishing, that he could oblige the world so much as he hath done, by his repeated experiments in husbandry, and his judicious observations upon them: it is therefore less to be wondered at, that this circumstance escaped him.

The ingenious Mr. Benjamin Stillingfleet also, in the second edition of his Miscellaneous Tracts, in a note, p. 175-6, speaks of an insect, which is probably the same as that which we are seeking to destroy.—His words are,

* Mine was also sown according to the new husbandry.

† First Syndic.

“ Thus

“ Thus in Suffolk, and in some parts of Norfolk, the
 “ farmers find it their interest to encourage the breed of
 “ rooks, as the only means to free their grounds from the
 “ grub, from which the tree or blind-beetle comes, and
 “ which in its grub state destroys the roots of corn and
 “ grass, to such a degree, that I myself have seen a piece
 “ of pasture-land, where you might turn up the turf with
 “ your feet.

“ Mr. Matthews, a very observing and excellent farmer,
 “ of Wargrove in Berkshire, told me, that the rooks
 “ one year, whilst his men were houghing a turnep field,
 “ fate down in part of it, where they were not at work,
 “ and that the crop was very fine in that part, whereas in
 “ the other part there were no turneps that year.”

We see, that M. de Chateauxvieux describes this worm as being first white, and afterwards becoming of a chestnut colour. I have carefully sought them at different periods during the past year, but always found them of the same chestnut colour, never varying in any particular, except that of size, which I find to be the case at all seasons, in which I have seen them.

The insect which Mr. Stillingfleet speaks of, he calls a grub, which, he says, destroys corn and grass: this induces me to believe, that it is the same insect (though the report which he relates from Mr. Matthews seems to contradict it) because I have observed, that the red or chestnut worm, never appears voluntarily upon the surface; but, when the earth is turned up, either with plough or spade, the rooks and crows are very bold in their approach to pick them up; a circumstance, which I own has in some degree abated my enmity to these birds: I therefore never destroy nor frighten them off my land whilst I am ploughing it; but when I sow, when the corn rises, and when it is ripe, I destroy or banish them as well as I can, because the mischief which they do at those times is intolerable.

A member of the Dublin Society informed me last summer, that some of his turneps were destroyed by a worm;
 I had

I had some few which decayed in their leaves, and became of a lemon colour, preceding the putrefaction which followed, and destroyed the turneps: I examined their roots, but could not discover any insect which had injured them, and therefore I cannot pronounce that it is the red-worm which destroyed this gentleman's turneps; but I shall be very watchful with respect to this circumstance, upon every opportunity which may present itself.

I have observed my lucerne to decay in its tops, soon after it has been up; and upon examining the roots, I have found the red-worm, which had cut them off.

This insect seems to be every where in Ireland called the red-worm; by some of the English writers who have spoken of an insect, which destroys corn in the manner already mentioned; which I think is undoubtedly the same: it is called a grub, by others the large maggot, and the rook-worm, because the rooks eat it; but as none of the writers have given any other description of it, than the name by which they respectively call it, I shall endeavour to describe it.

Red-worms are about half an inch long, and about one tenth of an inch in diameter: they are jointed in their skins, and are of a very firm texture: they have many short legs, two small black specks, which appear to be their eyes; and two small points springing from their heads, with which I believe they cut the corn, and which, in that work, I apprehend, act like forceps: and all that I have seen of this species, are of a bright chestnut colour. For this reason, I should conceive it would be more descriptive to call them the chestnut worms.

When they are exposed to the air, by turning up the earth which is infested with them, they will very soon cover themselves again in the soil, which they are very capable of doing, by the strength which their make gives them, although they appear to be a sluggish insect, and have not the advantage of a sliminess upon their skins, which the common large creeping worm has, which enables that inoffensive worm to penetrate the earth, and get under timber and stones with ease.

The red-worm, immediately endeavouring to cover itself from the air, is certainly from natural instinct, as it will soon die, when exposed to the air; as will appear by the experiment, No. 10. hereafter mentioned.

These worms destroy wheat, barley, oats, and lucerne, whilst in an infant state, in the months of March, April, and May. Late-sown barley and oats, they will destroy as late as June. I have not yet experienced, that they destroy any other crops.

The mischief done by them is in dry weather. Rain sufficient to penetrate the ground, makes them desist from destroying the corn; and, I suppose, every thing else which they at any time injure.

They cut wheat off, just above the crown of the roots; barley and oats in the same place, and also higher up, upon any part of the stem, which is below the surface of the earth.

These worms seem to abound more in ground which is lightly tilled, than in such as hath been well tilled; but, in lay ground, they seem to be more numerous than any where else: and the fields upon my farm, in which I have found them, are wetter than other fields where they are not; whether that circumstance contributes to their increase, I cannot say; but the following experiments prove, that they will live longer in water than they can, when exposed to the open air.

Experiments on Red-worms.

Numb. 1. I put ten red worms into a wine glass with common salt in it. They were all dead in four hours.

Numb. 2. Into a glass with brine in it I put ten red-worms. They were all dead in six hours.

Numb. 3. Into a glass with lime in it, which had been slaked for a long time, and exposed to the weather, I put the like number. They were all dead in forty-four hours.

Numb.

Numb. 4. Into a glafs with the above lime, and some water in it, I put the like number. They were dead in twenty hours.

Numb. 5. Into a glafs with lime newly flaked, and when cold, I put the like number. They were dead in fourteen hours.

Numb. 6. Into lime-water, made with cold water *, I put the like number. They were dead in ten hours.

Numb. 7. Into a glafs with foot in it, I put the like number. They were dead in four hours.

Numb. 8. Into foot and water, I put the like number. They were dead in four hours.

Numb. 9. Into fair water, I put the like number. They were dead in fifty-two hours.

Numb. 10. Into a glafs, without any thing in it, I put the like number. They were dead in thirty-two hours.

By these experiments we see all the articles used will kill this insect in a short time, particularly the salt and foot. I thought it necessary to consider different articles, the better to suit different parts of the kingdom.

Where lime can be conveniently had, and that it is used as a manure, I am apt to believe, from the experiments, that no injury can be sustained from these worms; but I am afraid a small quantity will not effectually destroy them; besides, I should fear, if it were not put on before the sowing of the corn, that it might singe the blades of the corn; for, from the experiments, it appears, that lime newly flaked, is more suddenly destructive to them than old lime, and therefore it is to be preferred.

Where lime is used for no other purpose than to destroy this worm, I should conceive, that about eight barrels, regularly sown by hand on an acre of ground, might be sufficient: it must be first flaked and cold before a man

* Lime-water made for medicinal use, is always made with boiling water, but as that cannot be in the case before us, I therefore used cold water.

can possibly cast it upon the ground with his hand, lime being a very strong caustick; and, even when it is cold, the man should have a thick glove upon his hand.

Where salt shall be used to destroy this worm, it must always be sown upon the ground, before the intended crop; for, although corn will vegetate, and receive benefit from salt as a manure, when it is used antecedent to the sowing the corn, yet, if it be added after the corn is growing, it will certainly destroy it: and therefore, it should never be used for this purpose, but before the corn is sown, or at least before it vegetates.

I conceive that where salt is used for this purpose only, about four hundred and a half to an acre will answer the purpose, which is a trifle more than one ounce to every square yard.

We see by the experiment, that foot kills this worm as soon as salt; and, as in most places it is to be had at a much less price than salt, I think there can be no doubt about preferring of it; besides which, it may be safely used after the corn is up.

I had some small parcels of barley under experiments, which these worms began to destroy; and in order to convey the foot as soon as possible to the roots of the plants, I mixed a little of it in water, and poured it on the plants with a garden watering-pot; the consequence was, that I did not lose one plant afterwards.

It will hardly be imagined, that I mean that the same method is to be pursued upon a whole farm: no; the method I would recommend to the practice of the farmer is this, to spread or cast by hand, as he sows his corn, about six or eight barrels of foot on an acre, and let him be careful to choose a calm day for the work, otherwise the wind will carry away great part of it: and as what remains cannot be regularly disposed, let him be careful to do it early enough in the spring, that the rain may wash the foot and convey it to the roots of the plants, before the worm begins the mischief; if he does this, I am persuaded his crop will be preserved.

We see by the experiments, that this worm will live longer in water, by twenty hours, than when exposed to the open air; but at length, *i. e.* in fifty-two hours, they died in the water; perhaps this might be from the effect of drowning; but if so, I might have expected they would have been totally destroyed in my two fields in the winter of 1763 and 1764, by the immoderate rains which fell at that season for a long continuance, by which the land was often flooded. But they survived that winter, as appeared by the great loss I afterwards sustained, by their destroying my wheat; and therefore, whether water be an enemy to them or not, it seems not easy to determine: but if these which died in the glass of water were really drowned; yet, I think we may conclude, that water is necessary to their existence in the earth, and probably aids them in getting their food from it: and what seems to confirm this notion is, that when the land is wet, they do not touch the corn, but as soon as ever the land is dry, they begin their mischief. However, this speculation I must submit to the consideration of persons more capable of discussing it than I am.

We see by the experiment, No. 10. that they cannot live in the open air; which seems to prove, that, where they abound in land, the oftener it is ploughed, particularly in the summer, when they cannot penetrate the ground so easily as when it is moist, they must be, by such ploughing, greatly diminished; besides which, the frequent ploughing gives the crows more opportunities of picking them up, in which, as I before said, they are very watchful.

Frequent ploughing has been recommended by some writers, as the only means of destroying this worm; and they have recommended the ploughs being stuck with nails, urging, that by those nails the worms are cut to pieces; others have recommended walnut leaves being soaked in water, to sprinkle the land; and steeping feed-corn in various liquors, as infallible remedies: but such methods as these are founded upon mistaken principles; they only mislead the farmer, and must disappoint him.

Worlidge recommends a strong lye made of fixed salts, but that would be impracticable. Mortimer recommends sea-water, for such lands as are near the sea-coast, which I believe would answer very well. He says he used foot once with success, but that it did not succeed with him afterwards. I am persuaded he did not use the foot early enough to have it washed into the ground by rain, or perhaps he used too small a quantity.

I would not be thought to arrogate any merit to myself, on account of what I have here offered, on this subject, since it appears, that other persons have used the articles which I have recommended, against this common enemy; but many persons have been disappointed in their expectations from these remedies, which must have arisen from their either having used too small a quantity, or not having observed the necessary precautions; if those, which I have recommended, shall be put in practice, and found to answer, I shall think myself amply rewarded.

NUMBER LXI.

Comparative Reflexions on the different Methods of cultivating Lucerne.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

I Thought not long ago, that I had advanced all such reflexions on the culture of lucerne as seemed important enough to deserve the notice of the public through your channel. Since that time, however, several have offered themselves, which appeared worthy an address to you. I sit down therefore to communicate them.

I. Your correspondent, "A member of the society," in his letter, marked No. LXI. of your last Volume, assigns a plain reason for being an advocate for Mr. *Rocque's* method of cultivating lucerne, in preference to Mr. *Miller's*,

viz.

viz. "I imagine the farmer will be much more likely to
" adopt the first than the last; and the culture of lucerne
" can produce very little advantage to the nation, unless
" it is *generally* adopted by the farmer."

This, gentlemen, is a *plain* and *good* reason; and I have never discouraged Mr. *Rocque's* method for this very reason; yet I think the methods of *sowing in drills* and *transplanting into beds* should not be discouraged; for gentlemen may try their comparative excellence with that of the *broad-cast* method; and if upon a fair calculation it appears more profitable, the sensible farmers, who profit by the first method, will be inclined to profit still more by the second and third. If the *expence* and *return* be what the celebrated author of the essays on husbandry, as reprinted in your work, state *transplanting* at, the method seems highly eligible, even in considerable undertakings, where a man's purse will support it. I have, however, even in this very dry summer, found the weeding by the hand-hoe and the hand exceedingly troublesome.

II. The principles of the *new husbandry* appear to be strongly recommended by this method of drilling and transplanting of lucerne. For though I was obliged, soon after transplanting, to give water pretty frequently to my plants (and by not giving it soon enough, I lost several) yet I have given them none for many weeks in this intense drought; and notwithstanding this, the plants have thriven surprisingly, the pulverized state of the earth, by good digging, having kept it moist, and enabled the roots of the plants to shoot too deep to suffer from the dry weather. The extreme row, and the ends of several rows, in which the earth was less thoroughly dug, have turned yellow, and thrive much less than the rest; and it is not certain whether they will recover.

III. Mr. *Rocque* thinks, that drills should be only ten inches wide; because if wider, the lucerne will lodge in them. (See his tract lately published.) I must beg leave to dissent from him. I have made my drills alternately at about twelve inches distance, and find them too strait to
weed

weed in with conveniency. When I have weeded, I draw up the earth to the roots of the plants; and this management serves to keep them erect. But if they should lodge, I see not any great inconvenience, unless the weather be rainy; and then it is a necessary inconvenience, it being impossible to keep up lucerne of great growth.

IV. Mr. *Rocque* thinks, that half a crop of corn must be sown with the lucerne; otherwise weeds will get up, and they must be *mown*, and the *lucerne with them*. Now the question is, Whether the corn, getting above the lucerne, will not do it *as much*, or *nearly as much* harm as the weeds would; and consequently, whether or no it be not an essential defect in this method of culture, to have any thing which will *draw the soil*, and over-top the lucerne so much as half a crop of corn will?

To determine this point, let three pieces of equal ground be sown with the same lucerne, in *drills* and in *broad-cast*, with half a crop of corn, and by itself. Let a comparison be made of the height of the lucerne when kept weeded in one, and when the corn and weeds are mowed in the other; and then the advantage may be fairly determined.

V. Mr. *Rocque* appears fully convinced, that cutting of lucerne, when *young*, makes it *bleed* much, and *hurts* it so, that it is a long time before it recovers. He no otherwise determines the time when it is *not too young* to be cut, than by saying it may safely be cut when the corn is mown; and again, that it should never be cut, but when in bloom.

The inhabitants of *Languedoc* cut it when six or seven inches high. I cut some just two months after sowing, when it was twice that height, and shall carefully observe whether or no the roots of that part of the row be worse than the rest in the row, or no.

VI. Some modern writers assure us, that lucerne seed, sowed in *England*, is not only *as good*, but *better* than foreign seed. However, Mr. *Rocque* assures us, that it is not worth any person's while to save lucerne seed on any sort of ground in *England*. Perhaps, gentlemen, the reasons of
this

this dissent may be fairly exposed, by observing that Mr. *Rocque* founds his assertion on experiments of seed saved from the *second* growth. All gardeners, whom I have read or spoke with, agree, that seed should be saved from the *earliest* growths, for several obvious reasons, *viz.* that the weather, especially in our climate, is then most favourable for saving of seeds; the sun is *hottest* to *mature* it; the rains and dews, which retard its ripening, are easiest blown off; the roots have most vigour to give it full juices, and the frosts are least likely to nip it before it be fully ripe. Mr. *Rocque's* sole objection is, that the first crop is *too rank, and apt to rot at the bottom*. Now it seems to me, that the *very rankness* is the foundation of the goodness and plenty of seed, as it implies powerful juices. And as to the danger of rotting at the bottom, when wet weather and cold dews and frosts succeed at the latter end of the year, there is much more danger.

VII. It has been observed, gentlemen, with much more probability, that as a plant's running to seed weakens it much, and the generality of plants die in consequence of seeding, lucerne should not be suffered to seed till its third year. I design, however, to suffer some few of my earliest and finest transplanted lucerne, in this its second year, to go to seed, in order to try what effect in weakening the plant can be discovered.

VIII. Mr. *Rocque* apprehends, that if due attention had been paid to the answers to queries about lucerne, extracted from Mr. *Hartlib's* legacy, and published in No. LX. of your last Volume, "our *modern writers* would not have drawn the public into *so many errors*." I must here dissent from Mr. *Rocque*; for that whole paper is so full of point-blank contradictions, without determining at last in favour of any of the assertions, that I know not any conclusion more naturally to be drawn from it by the reader than this, that it would be imprudent to throw away time and money in trying an experiment, about the method of which the several writers professing themselves masters were at direct opposition, and gave neither *reason* nor *experiment* in favour of your repugnant tenets.

I doubt not, gentlemen, but the amassing such an heap of contradictions, contributed considerably to stop the progress of the culture of lucerne. That I may not be thought to advance this assertion without good grounds, I here present you and the public with a brief view of those several contradictions under the principal heads.

Quantity of seed. Twelve or fifteen pounds, first A.—Three pounds, second A. two strong porters full loads, *ibid.*—One-sixth of corn usually sowed, third A.—One-fourth of a porter's load, *ibid.* about sixteen pounds, N.

Time of sowing. February, first A.—April, third A.

Soil proper. Whettish, first A.—Rich, loose, and light, third A.—Rather moist, *ibid.*—Dry, strong, and gravelly, P. S.

Uses. For *all cattle*, but given moderately, and *never green to kine*, third A.—For nothing through all summer, P. S.—Given *alone all the year long to all cattle*, *ibid.*

Sown with what. With oats, but best alone, first A.—With some oats best, third A.

Duration. Ten, twelve, or fifteen years, third A.

N. B. A. Stands for *Answer*, P. S. for *Postscript*, and N. for *Note*.

IX. Another reason which, I dare say, greatly retarded the propagation of lucerne in *England*, was the badness of the seed. When there is no great demand, retailers are not very careful about the goodness of the ware; but when that quickens, their attention quickens with it. In the spring of the year 1752, I got from one of the principal seedsmen in *London*, as much lucerne seed as cost me on the spot two pounds ten shillings; and it was so bad, that scarce any of it came up.

I am, GENTLEMEN, [as usual]

East-Newton,
July 22, 1765.

Your friend and servant,
THOMAS COMBER.
P. S. The

P. S. The advice given by Mr. *Rocque*, about sprinkling salt in all the beds of lucerne-hay, apprehended to be ill-gotten, is worthy to be practised, with regard to all species of hay which is supposed to have suffered by the weather. My only brother (the Rev. Mr. *William Comber*, vicar of Kirkby-Moor-side in Yorkshire) experienced the good effects of salt in his hay last year, and intends to use it more liberally in this year's hay, if occasion require.

Occasional Reflexions on the Profit of a Dairy, compared with those of Tillage.

GENTLEMEN,

I Think the public much obliged to the gentleman who signs himself Y. for his excellent letter, No. LXII. in your last Volume, containing "Reasons why Farming so often proves *unprofitable*." It highly deserves the attention of the gentleman, and is wrote with great truth of sentiment, and clearness of expression.

This encomium may, I hope, convince both him and you, that when I dissent from him on any other subject, it is with some degree of regret. And though I have occasionally dissented from *Ruricola Glocestris* on some subjects, I must agree with him in thinking, that Mr. Y. has by no means proved, that *agriculture* or *tillage*, when properly managed, is not the chief thing on which the farmer can reasonably depend.

Mr. Y. in p. 285. of your last Volume, has allowed himself to treat *Ruricola* in a manner which deserves an apology; and that apology is found in the acknowledgement he makes, p. 287. viz. that he is *too warm*.

Ruricola was not insensible of this treatment, and answers it coolly enough in p. 403. when he writes, "I would just say, &c." But he is warm enough, when he accuses himself of *folly* in taking any notice of Y's calculation, which so evidently contradicts itself, p. 402.

The subject of dispute betwixt these gentlemen is *not trifling*, but may be of great consequence to the public. For the public will find a very sensible difference result from men's being inclined to *tillage* or *dairy*, as the more profitable branch of husbandry.

Mr. Y. certainly can write with great clearness on subjects which seem more difficult to treat than is the stating an account from his ledger. Nor can I justly, any more than *Ruricola*, accuse myself of *inattention*; and yet I am not able to see, from his account, that he has at all evinced his point. There must be some defect in his reckoning, or in my conception of it. To me, gentlemen, he seems to have made a very considerable omission; or else I do not know what is meant by the word *profit*, which yet seems very easy to be understood.

I will, gentlemen, suggest some observations on his experiments. First, on that of 1763.

1. Mr. Y. states the expences of winter-keeping his four cows at three pounds fifteen shillings, *i. e.* not one pound each. To account for this, he only reckons one ton and seven hundred weight of hay, *i. e.* little more than one load and a half, and two loads and a half of straw. This is but the quantity of a load to a cow of a mixture, nearly two-thirds of which were straw. Our farmers know, that if they should keep their cows thus poorly, they would be in no condition to give milk in summer, nor could they reasonably expect to get *any profit at all* by them. But Mr. Y. owns, that his cows had their share of all his own straw, which five acres of oats yielded; that is, their equal share with four horses, about half his straw. And not one penny is reckoned for this.

2. We are not *probably* to understand, that the cows were kept in the house all the winter to their wretched dry meat. Most probably they run out at grass all the while; and yet nothing is reckoned for this winter-grass, which should be rated at something very considerable. Were not this the case, we must suppose four cows to live on half a load of straw from December 30 to February 15, full six weeks.

3. How-

3. However cheap Mr. Y. may get his fuel, he should consider that this fuel, when got up and led home, might have been used for other purposes, and therefore should be charged to the dairy.

4. The expence of bowls, caldrons, vats, &c. should have been added.

5. Did Mr. Y. give his cows no corn in spring? If so, they must nurse their calves in spring most wretchedly.

6. Mr. Y. seems to have forgot the most material thing of all, the expences of the summer keeping! He says, he fed two of his closes for hay late. Probably the cows ran in them. He gave them a summer gait, first, in six acres to themselves, and in a common pasture of two acres; then they had the fog or after-math of five acres; and, lastly, of three acres, and four days run in clover. What must all this amount to?

7. Mr. Y. forgets tithe for his cows, and carrying his goods to market.

8. Mr. Y. in his produce reckons two yearling calves at three pounds ten shillings. But since he allows nothing for the grass and hay which they eat in the summer and winter, and he sold two sucking calves for fifteen shillings and sixpence, he ought only to add *as much more*, and the value of the milk they drank. In short, in all probability, if Mr. Y. had stated his expences fairly, and his produce as fairly, he would scarce have had one pound *per head clear profit*. And indeed (in p. 278, 279.) Mr. Y. owns, that a cow's feed a twelvemonth is above four pounds. So that he scarce leaves himself twenty shillings *per head* in 1763.

Gentlemen, what *ridiculous trifling* is this with a man's self and the public, under pretence of demonstration by figures!

Secondly, on that of 1764.

1. Mr. Y. reckons only twenty-two hundred weight of hay, and half a load of straw, for four cows! Can any reasonable man suppose they could be kept on this? No, surely. Himself owns, that they had all the straw which
could

could be spared from his whole farm, and yet he reckons not one farthing for all this ! Is this calculation ? — Observation two, three, four, five, six, and seven, are all to be applied here, except the single article of clover.

In produce, Mr. Y. reckons the price of two heifers sold (deducting the last year's value) to his profit. But can any body suppose, that these two heifers were kept in summer with four cows on four acres of ground, and in winter with about a ton of hay, and half a load of straw ? Not one farthing then should be reckoned of that price to the article of profit.

Our farmers generally reckon, that a good cow will eat in winter two or three loads of hay ; and I should therefore think it much more probable, that Mr. Y.'s four cows might eat all the hay of his eight acres in 1763, and his four cows and two heifers his ten acres in 1764, besides the small quantities charged in the expences, and probably bought them, that they could live on such pittance as are allotted in the table of expences.

Gentlemen, Mr. Y. boasts, p. 278. of having cleared up the *mystery* of the cows ; but, I fear, he has made his calculation all a mystery.

As to the profit by the hogs, which Mr. Y. represents so considerable, that he avers, “ were it not for the hogs, “ I would have nothing to do with a dairy, with four “ pounds profit *per* cow,” (p. 279.) *Ruricola* says, “ His “ method of feeding hogs is altogether as eligible, where “ there are no cows, as where there are ever so many,” p. 403.

I cannot, gentlemen, go so far as *Ruricola* does ; because Mr. Y. observes, p. 280. “ that in 1763, all the “ whey and flet-milk was thrown into the hog's cistern.” Mr. Y. however, should remember, that he bred two calves in 1763, and consequently they must have drunk a *good proportion* of the whey and flet-milk of four cows, especially as the family used much milk unskimmed, I apprehend ; and therefore the profit of the hogs arising from the dairy could not be considerable.

Since

Since Mr. Y. confesses, "I am *totally ignorant* of every thing concerning a dairy," p. 277. I greatly apprehend that his servants have imposed on him, except in what he actually sold, by bringing to the account of profit many articles for house-use, to please him, which never existed; and possibly his cows eat much corn and hay, of which he knew nothing. They could never give any milk, considerable, on the allowances which he states.

I am, GENTLEMEN,

East-Newton,
July 22, 1765.

Your humble servant,

THOMAS COMBER.

P. S. *Ruricola* is of opinion (see p. 401. of your last Volume) that the winter expences in the two experiments relate to *only one winter*, and make the sum such as to leave little more than twenty shillings *per head clear profit*. I can hardly suppose, gentlemen, any person, of tolerable common sense, capable of committing such blunders; much less, that Mr. Y. whose abilities, when *properly applied*, are very good, should commit such. But as he has confessedly made several mistakes in his accounts, and must have been guilty of great confusion in stating of them, to give even the appearance of this conclusion to *Ruricola*, I should advise him rather to *throw away* or *burn* his ledger, than puzzle himself and others in this unedifying manner.

NUMBER LXII.

Continuation of the comparative Reflexions on the different Methods of cultivating Lucerne.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

AS I apprehend, that many who have not opportunities of making experiments on lucerne, &c. may wish to become acquainted with the success of those who do

do make them, I sit down to communicate such further remarks as have occurred to me in my attempts this summer.

I. As to my *transplanted lucerne*, it is grown now to the height of about sixteen or twenty inches *in general*, tho' many plants died in consequence of the drought which followed its transplantation in the latter end of *April*. It is not yet generally in flower, as I expected it would have been; and its branches are very little, insomuch that if any thing touch them a little roughly, as the hand or foot in weeding, they almost instantly break off.

I suspect that the dryness of the season has both retarded the flowering, and rendered the branches brittle. Though my ground was well dug, and by that means intirely free from quicks, yet the pains which have been required to keep it only tolerably clear of weeds, are almost incredible, notwithstanding the drought.

Swine's thistle, groundsoil, chickweed, &c. come up in amazing profusion and luxuriance; partly occasioned, I suppose, by the pulverized state of the earth; so that if these be not increased by some peculiarity of my soil, I fear, requisite pains will never be taken with any considerable quantity of transplanted lucerne. I set my plants at one foot distance from each other, and the rows two feet distance: but I am now convinced, that this distance is too small, the plants of each row intangling with one another, and hanging over the intervals so, that one cannot, without the utmost care, weed the intervals, and not break the branches of the lucerne.

II. As to my *sown lucerne*, the generality of that which was sown on the 19th of May, is now very flourishing, having been carefully weeded by hand in the rows, and the intervals hoed, and the earth mowed up to the roots of the plants. Many parts of that lucerne are about ten, twelve, fourteen, or sixteen inches high. That which was sown about a fortnight later, *viz.* on Whitsun-Wednesday, is not by far so flourishing. I have tried whether a single plant, of the first sowing, would abide early transplanting;

planting; and by sheltering it under a wall from the southern sun, and watering it, I have preserved it alive, though it was taken up a fortnight ago, and the root was very small.

III. As to my *Timothy-grass*, I wanted to try whether or no it would flourish in a very dry soil, and no rich one. I accordingly planted the roots, which Mr. *Perfett* sent me, in a very dry and channelly border, and about the midst of the late drought gave them twice or thrice a little water. They are however in a very thriving state, many of the stalks near a yard and half long, and the heads four or five inches, and in full bloom. It seems not a *forward* grass, but makes quick progress when it begins to grow; and must, I think, when reaped before it is too old, make a very good hay.

IV. As to *burnet*, the *great common wild burnet* is now in full red flower. The stalk is strong, and the leaves are harsh, and, I apprehend, cannot be very agreeable to any cattle, especially the *more tender* and delicate. As far as I remember, Mr. *Mills*, in his *Complete system*, turns the attention of his readers to this greatest sort, as supposing it to be most profitable for the farmer. But this it cannot be, because this sort dies away before winter. I have observed, in one of my last letters, that the sort which I apprehend to be the original Mr. *Rocque's*, is much smaller. But of this point I hope to be able hereafter to give a much more accurate account.

Both my sowings of lucerne came up in about ten or fourteen days; but my burnet-seed, though sown on the adjoining ground, and a soil which seemed more adopted to it, being gravelly, came not up in many weeks, being sown on the same day with my other lucerne, except a few stalks, insomuch that I thought the seed had been bad. About two or three weeks ago, however, it came up thick, but is yet very low, being in general not above an inch and a half high, though sown in the end of May.

V. There is another sort of grass, on which I would wish to have observations to be made. It goes with us in

the North by the name of *fuet-grafs*, on account (I suppose) of its fattening quality. It is chiefly found in fine sheep pastures, and though it grows low, yet grows very thick, and bears a *small white* flower. I will endeavour to send you a specimen, (though it is not plentiful here) marked A, and another marked B, of the head of the *large most common wild burnet*, as it was not in flower when I sent the stalk.

I am, GENTLEMEN, to you and the public,
 East-Newton, a friend and servant,
 July 17, 1765. THOMAS COMBER.

P. S. For the benefit of future experiments in transplanting of lucerne, I must remark, that I would earnestly advise them to avoid ground on which potatoes have lately been set. I thought this root would prepare and mellow the ground for lucerne; and accordingly I both *sowed* and *transplanted* lucerne in such. But, alas! though my gardener, and a boy which followed him, picked out all the potatoe roots which they could find, such numbers of small ones remained, as have shot up innumerable heads, and broke and destroyed in many places my rows of lucerne.

There does not seem, gentlemen, sufficient proof, that the *fote-fescue* produces with us the *manna-seed*, of which some *botanical writers* have lately spoke. But I find in *Parkinson* something of this kind asserted of a plant which he calls *Ischæmen sativum* sive *gramen mannæ esculentum*; (I should have expected *esculentæ*); the *white seed* of which (he says) is used by the *Germans* commonly in broth, as *oatmeal* with us.

I wish your correspondents would communicate any knowledge they have of the *fuet-grafs*, and its different names in different counties. I have found it both on *high* and *low*, *dry* and *wet*, situations; though rather on the former.

July 18, 1765. I have this moment desired an ingenious friend, who has connexions with the proprietor of
 the

the Barby-manufacture, to get me the best minutes of the circumstances which he can obtain: but, he tells me, that he apprehends the proprietor may be shy as to a communication.

Some of my burnet, sown on Wednesday in Whitsun-week, is just peeping above the ground. As it comes up so slow, it seems adviseable to weed the ground before the burnet comes up. I should have weeded mine, but I thought the seed would not come up at all.

I have transplanted some of my sown lucerne into defective parts of the rows; but apprehend no great success in many of them, which appear to have failed originally by swarms of ants. I have also cut within four inches of the ground some parts of my rows, to try whether the roots will be strengthened by checking this luxuriance of the head. July 19.

I have sought diligently in the place, where some time ago I gathered the grass called *fuet-grass*, but cannot find one stalk. I apprehend the drought has destroyed it, or the sheep have eaten it up; but I will send a specimen as soon as I can get any.

N U M B E R LXIII.

Account of a proposed Improvement of the Manure-plough.

GENTLEMEN,

IN the packet which I sent to you by Mr. *Etherington*, was a delineation of very considerable improvements on the *cutting-box*. I apprehend that packet is irretrievably lost. However, as I carry in my mind the idea of those improvements, I may some time again delineate them for your use.

In the mean season, gentlemen, I send you an improvement of the *manure-plough*. If the advantage of the old plough be any thing near what is represented, an improve-

A a a 2

ment

the North by the name of *fuet-grafs*, on account (I suppose) of its fattening quality. It is chiefly found in fine sheep pastures, and though it grows low, yet grows very thick, and bears a *small white* flower. I will endeavour to send you a specimen, (though it is not plentiful here) marked A, and another marked B, of the head of the *large most common wild burnet*, as it was not in flower when I sent the stalk.

I am, GENTLEMEN, to you and the public,
 East-Newton, a friend and servant,
 July 17, 1765. THOMAS COMBER.

P. S. For the benefit of future experiments in transplanting of lucerne, I must remark, that I would earnestly advise them to avoid ground on which potatoes have lately been set. I thought this root would prepare and mellow the ground for lucerne; and accordingly I both *sowed* and *transplanted* lucerne in such. But, alas! though my gardener, and a boy which followed him, picked out all the potatoe roots which they could find, such numbers of small ones remained, as have shot up innumerable heads, and broke and destroyed in many places my rows of lucerne.

There does not seem, gentlemen, sufficient proof, that the *fote-fescue* produces with us the *manna-seed*, of which some *botanical writers* have lately spoke. But I find in *Parkinson* something of this kind asserted of a plant which he calls *Ischæmen sativum* sive *gramen mannæ esculentum*; (I should have expected *esculentæ*); the *white seed* of which (he says) is used by the *Germans* commonly in broth, as *oatmeal* with us.

I wish your correspondents would communicate any knowledge they have of the *fuet-grafs*, and its different names in different counties. I have found it both on *high* and *low*, *dry* and *wet*, situations; though rather on the former.

July 18, 1765. I have this moment desired an ingenious friend, who has connexions with the proprietor of
 the

the Barby-manufacture, to get me the best minutes of the circumstances which he can obtain: but, he tells me, that he apprehends the proprietor may be shy as to a communication.

Some of my burnet, sown on Wednesday in Whitsun-week, is just peeping above the ground. As it comes up so slow, it seems adviseable to weed the ground before the burnet comes up. I should have weeded mine, but I thought the seed would not come up at all.

I have transplanted some of my sown lucerne into defective parts of the rows; but apprehend no great success in many of them, which appear to have failed originally by swarms of ants. I have also cut within four inches of the ground some parts of my rows, to try whether the roots will be strengthened by checking this luxuriance of the head. July 19.

I have sought diligently in the place, where some time ago I gathered the grass called *fuet-grass*, but cannot find one stalk. I apprehend the drought has destroyed it, or the sheep have eaten it up; but I will send a specimen as soon as I can get any.

NUMBER LXIII.

Account of a proposed Improvement of the Manure-plough.

GENTLEMEN,

IN the packet which I sent to you by Mr. *Etherington*, was a delineation of very considerable improvements on the *cutting-box*. I apprehend that packet is irretrievably lost. However, as I carry in my mind the idea of those improvements, I may some time again delineate them for your use.

In the mean season, gentlemen, I send you an improvement of the *manure-plough*. If the advantage of the old plough be any thing near what is represented, an improve-

ment of it must be *very valuable* *. I hope I have hit upon such improvement, so far as I can be assured by *theory*. I have had no time to make the experiment; and I am in great want of an ingenious artist.

I heartily wish, for the sake of the public, that whoever tries the manure-plough, either in its *old* or *improved* state, would carefully observe the different effects of *equal quantities of equal manure on equal soils*, with the only difference of the coulter being nearer each other in the one than in the other soil. I am apprehensive the effect must be in favour of the nearer coulters; but it is of importance to know whether that advantage overbalances the *expence* and *greater labour* attending more coulters.

Whenever the *manure-plough* is to be used in a field, which has a declivity, as most have, I should advise the plough to move *transversely* with regard to the declivity; so that the openings made by the coulters may *receive, retard, and disperse* the juices of the manure, which would otherwise descend too fast.

This descent, in all cases, is so obvious to common observation, that every farmer, I think, lays his manure chiefly on the higher parts of his ground, knowing that the rains will not fail to carry the juices of it to the lower.

In any use of the manure-plough, whether the *old* or *improved one*, great care is requisite to make a proper track at every *turn*; so that no considerable part remain *uncut*, or be *cut twice*. The track of the wheels will be of great assistance here; and in any case a steady horse should be led by a careful boy, to keep him in one track.

I have advised the two outermost coulters to stand at the distance of four inches and a half from the ends of the

* The account of the manure-plough, which gave occasion to Mr. Comber's attempting the improvement here proposed, will be found on p. 196, No. 25. Vol. 5. of our work. It were to be wished, that trials were made of all the feasible methods of constructing and using such an instrument: as the rendering manure more quickly, or more powerfully efficacious, is a matter of the highest importance to agriculture. We shall, therefore, be obliged to any gentleman, who having made experiments on this subject, will impart the result of them to us, with such observation as they may think proper. E.

axle, that if great care be taken, the last track of one turn, and the first of the next, may be just nine inches from each other; in which case the whole field would be equally cut.

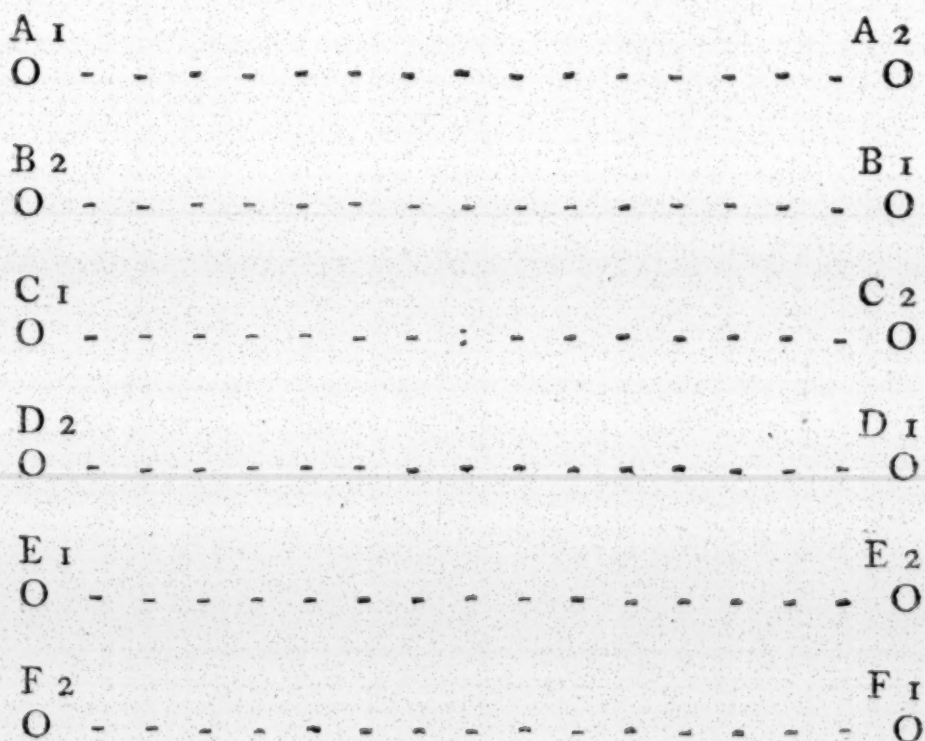
But such exactness seems not necessary. If any one thinks it is, he may have it by stretching a line with sticks at each end of the field, to direct the draught. I will add a sketch below.

I am, GENTLEMEN,

East-Newton,
July 19, 1765.

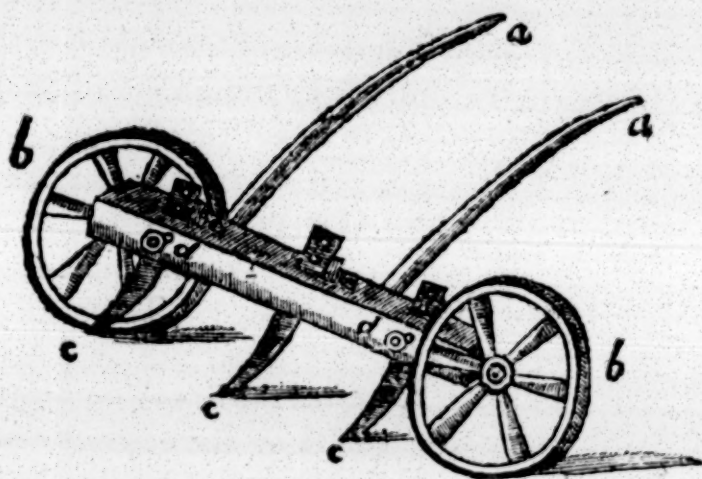
Your humble servant,
THOMAS COMBER.

Let A A, B B, &c. represent the lines stretched on sticks; each line at twice the breadth of the plough's track from the next. Let the plough move from A 1 to A 2, and then turn from C 1 to C 2; and then turn again from C 1 to C 2, and so on; and in return take the half divisions which remained unplowed: and so the cords will guide the plough all the way. If the expence of so much cord is grudged, two lengths may serve; and the cords may be moved.



Delincation

Delineation of an Improvement of the Manure-plough, recommended in Mr. Mills's Complete Husbandry.



a a, the two handles.

b b, the two small wheels.

c c c, the points of the coulters.

d d, two moveable rings, fixed with staples to the beam, to which the harness is fastened.

e e, wedges at the back of the coulters, to set the coulters more or less forwards, as the soil requires.

N. B. There are holes in the coulters to fasten them above and below, higher or lower, as the ploughman chooses to go deeper or shallower.

The dimensions of each part I will not pretend to ascertain, as they must be different to suit every soil, and the draught every man proposes to use. The best model seems that which is strong enough to stand work in any common soil, and yet not too heavy for one horse.

The advantages of this improved manure-plough.

1. The addition of wheels gives steadiness to the whole; and these being small, will be so far from adding to the load, that they will greatly ease it.

2. This improved manure-plough is disincumbered of the pole or forward beam, to which the cattle were fixed in the old one, and may be drawn by one horse, if made dexterously by a good mechanick.

1

3. The

3. The horse or other cattle being fastened to moveable rings, will always draw in the line which is easiest to the draught.

4. The ploughman, when he has a mind to go *deeper* or *shallower* in the same soil, has nothing to do but to press the handles more or less upwards or downwards; and when he has a mind to disengage his coulters quite, in order to turn or to leave off his work, he need only press his handles downwards, till he bring the points of his coulters above the surface of the ground.

5. This machine is conveyed to and from the field without the help of any sledge, as the ploughman need only keep the handles in such a position as to preserve the coulters out of the soil.

6. Though I have added wedges, holes, and pins to set the coulters forwards or backwards, higher and lower, yet the advantage of being able to move the coulters by the handles is such, that if the proprietor choose to have a more simple and cheaper machine, he may have his coulters fixed; only in that case the ploughman will have more labour; for he can then suit his position of the coulters to his different soils, or different parts of the same soil, only by changing the position of his hands.

7. The handles may be so contrived as to be moveable in their sockets, and consequently to set the coulters more or less forward. But as great stress is laid on them, and they must be firm, or all the work is at an end, perhaps the making the coulters moveable is the easier way.

8. One principal advantage of adding small wheels to the machine, is, that the beam in which the coulters are, may be greatly lengthened, without making the whole unwieldy, and in danger of being broke every minute without wheels. By this means more coulters may be used, and at greater distances, without inconveniencies, and consequently much more work done in a given time with a given draught. The distance fixed on by the author of the old plough, seems quite too little. I should advise to have the coulters not less than nine inches, and the two
outermost

outermost of five to be four inches and a half from the track of the wheels. By this disposition, if care is taken, the juices of the manure, which falls further from an opening made by the coulter, will only have four inches and a half to run: and it is well known, that any liquid poured on the earth in a proper season, when it is not bound, will easily insinuate by means of opening at that distance.

N U M B E R L X I V .

Experiments and Observations on the Means of preventing the Smut in Corn : With an Inquiry into the Cause of it.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

I HAVE some years ago, either in conversation, or in some author, or perhaps in both, met with an account, that liming and brining of wheat, to prevent its being black or smutty, was by accident introduced into use in the following manner.

A ship or vessel, laden with wheat, was stranded in some part of England, and the wheat was spoiled, for the use of flour, by the sea-water: but as it happened at a proper season for sowing, some part, or all of it, was used for such purpose. The same year, almost all the other wheat sown in England proved black: but this, which had been much soaked with salt-water, proved free from that disorder. How far this relation is true, I must leave a matter of doubt.

Many farmers have told me, that by changing their seed, and sowing good wheat, well limed and brined, they were sure of having their crops free from smut. But if by chance they had not quite enough seed limed and brined, to finish the field, and sowed a little of it dry, it was always

ways black. Now, if this is true, the changing of wheat seems to have very little or nothing to do in preventing the smut. For it is to be presumed, they finished with the same seed; and the stress therefore appears to lay on the liming and brining; and, I should think, on brining only. For, I apprehend, that the lime, in such case, was only made use of for drying the wheat, in order to make it be more readily and easily sown. Yet, perhaps, and very likely, the lime may be of some service in preventing insects or vermine destroying the body of the wheat in the ground. But as some farmers have laid great stress on lime, to prevent blackness in wheat; and as I had this last year a ten-acre field, which had been well limed ready for sowing, I had the experiment tried, to see whether lime in the ground would prevent the blackness. I therefore had three acres of this field sown with dry wheat, and the other seven with wheat limed and brined; all of the same wheat, from one threshing, and raised on a quite different soil, at six miles distance, the air being different, as the situation was under a hill.

Just before harvest, on examining this field, which made a fine appearance, (for the corn was as thick as it could stand; so that if it had not been white strawed, it must have been lodged) we found a sixth part at least of the wheat with ears, containing nothing but colour; and, from the most minute observation, we could find no difference from that which was limed and brined, or that part which was sown dry; saving a small dry brow, or bank, (for this is a wet field) which proved quite free from this disorder. I think from this it should appear, that smuttiness in wheat is occasioned by the weather affecting some particular pieces of land more one year than another; and that this year it was owing to the last winter and spring's being so excessive wet *. For my thrasher says,

* It is in general allowed, that a wet season is an auxiliary cause of smut in corn. It is not, however, to the simple effects of moisture in the vegetative œconomy of the plant that this is

says, this field used to produce very fine coloured wheat ; and the brow being dry, and free from blackness, is a proof of it ; and that, therefore, liming and brining will not always prevent smutty wheat. Take another instance this last year.

The day after my wheat was found to be so black, I met a pretty large farmer, who lives about five miles from me, to whom I related the story of my wheat ; and asked him if he had heard of much black wheat being about his part of the country. To which he replied, and I believe he is a very honest man, that he never had any black wheat till this year, and that now he had four acres, which is the blackest he ever yet saw. I asked him, if he limed and brined : he said, yes ; and what is something very extraordinary, I have a piece of three acres, sown with the same wheat from one cleaning, limed and brined, in the same manner, which is quite bright and clear. He

owing : because it is well known, that the principal cause of smut is a small animal, which breeding in the grain destroys it, and produces the appearance of blackness, to which the name of smut is given. This animal is, doubtless, produced by regular generation ; and, therefore, all the share which the wet season can have in the increasing the smut, is only in the aiding the more extensive propagation of it. Another great cause of the increase of smut, is found in the use of too large a quantity of crude dung, which moulding, encourages the breeding of the smut animals ; and has been the occasion of great detriment to persons who have managed injudiciously as to that point. A strong illustration of this may be seen in the young farmer's letter, inserted page 104 of the *Museum Rusticum* for last August. Premising the cause of the smut to be, as it unquestionably is, an animal, it would not be difficult to resolve our correspondent's doubts with respect to the effects of the change of grain, liming, brining, &c. either separately or together. But as such a discussion appears too long and incommodious for the form of a note, we should, as well as the public, be greatly obliged to any of our correspondents, who are masters of this subject, to favour us with their opinion at large on this important matter ; as it may afford an useful light to many, who may be in the same situation as to doubt, with respect to the best manner of practice, as to the means of preserving corn from this destructive accident. R.

told

told me, on asking him, that the four-acre field was very wet, and the three-acre very dry.

This person has been a farmer near thirty years, and used the same land. Some of your correspondents may, perhaps, account for it from some other cause. But I can venture to say, that there has not been any thing like so much black wheat about this part of the country for many years.

As I have mentioned to have limed this ten-acre field, though it had no effect in preventing the smuttiness of the wheat, yet it had to the crop; for it prevented the walder and buddle from growing, to which this field is much subject *; and notwithstanding the great loss in the ears, I was well paid for my lime this year.

I have sown this season several acres of rey-grass amongst my wheat, on light land, by way of experiment. Some are great advocates for it, others quite the reverse. However, in some kind of lands, it is a most profitable pasture, and as to its drawing the lands so much as has been mentioned, I think the matter very dubious; but am of opinion, if it should remain only one year in the ground, and be afterwards fed down with sheep, it would be of service, rather than prejudice, to some lands. Time will shew this, if I live, to

GENTLEMEN,

Your most humble servant,

Nov. 1765.

The KENTISHMAN.

* Walder is pretty much like kilck, and the yellow buddle like a large marygold. The blew buddle, of which we have a great deal, I do not at present know how to describe †.

† We are much obliged to our correspondent, the Kentishman, for this compliance with our former request, that he would explain what he means by *walder* and *buddle*, mentioned several times in his letters. But we are afraid, that the brief account he here gives of them, without any description of the figure, leaf, flowers, &c. will leave it as difficult to comprehend what species of plants he means by these local names, as it was before his explanation. E. A.

NUMBER LXV.

Observations on the Structure and Utility of the Spiky Roller, intended to break, and lay fine, stiff and clotted Ground, in a Letter to the Editors: With additional Remarks relative to the Use and Advantages of this Instrument.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

GIVE me leave, through the channel of your *Museum Rusticum*, to communicate, to my brother farmers, a most useful implement in husbandry, which has but of late been introduced amongst us. It is so very efficacious, and its powers so much superior to all other instruments yet contrived for the reduction of strong land, that, I think, there is not any possessor of such ground (who has no objection to a fine seed furrow) that will be without this instrument. This last autumn it has been of the greatest utility. For whilst the neighbouring farmers were waiting for rain, so that they might with their own rolls and harrows bring their land to that degree of fineness they could wish to have their seed sown in: those who were possessed of the spiky roller, (for that is the name of the implement I am going to give some faint idea of, as it is impossible by letter to make any body more fully acquainted with it) had their fallows in such a degree of fineness, as I never before saw that kind of land in; and had finished the whole of their sowing, before the others ever thought of taking their plows, &c. into the field.

To begin then with the best description I can give of the most complete I have yet seen. The roller is of oak, six-feet three inches long, seventeen inches diameter, hooped with iron at each end; the circumference divided into eighteen equal parts, where rows of iron spikes are set
(in

(in the quincunx order) at six inches distance, one from the other, in the rows : so that there are thirteen spikes in one row, and twelve in every other throughout the circumference. The number of the spikes is two hundred and twenty-five. They are to project four inches and a half from the roller, and to be one inch by three quarters of an inch square at that part of the spike next the roll, tapering off to three quarters of an inch by half an inch at the top part. The whole length of the spike, with what is driven into the wood, will be about nine inches long. And I would advise the falling side at the end of each spike to have a stroke or two with the hammer, that they may be a little more pointed to give them greater facility in penetrating the very hard clots they are designed to break. Every spike will weigh about one pound and a quarter, which will be of sufficient strength.

The frame should be made for horses to draw a-breast, or with a pole for oxen. For by the horses, &c. drawing double, the roll is more easily turned ; and, besides, it is likely to prevent the end of the roller from going over the driver, if by chance he should fall. That it may with greater ease and conveniency be conveyed from field to field, or to any distance, an axis is fixed upon the frame immediately above the roll with wheels ; so that by turning the frame, the wheels take up the roll, and away you may drive. And, when you have brought it to the field, in order to make use of it, by turning the frame back again, you let down the roll, and then the wheels are carried by the roller.

Since making of the above description, I have talked with the wheelwright, who tells me, he could greatly improve the manner of fixing the wheels, by making them run within the frame : for as they now run without, it sets the wheels at such a distance, as makes it difficult to pass through gates made only the common width. And likewise says, that great care must be taken in fixing that part of the frame which the gudgeons of the roll runs in : for by that means the roll will be let down with greater ease ;

case ; which will not be the case, if regard is not paid to that particular. The roller, frame, wheels, &c. are, together, about eleven hundred weight. If you can, by altering any part of this description, make it appear in a clearer light to your readers, (and if you think it worth publishing) you have my liberty for so doing.

I am, GENTLEMEN,

Nottinghamshire,
Nov. 22, 1765.

Your's,
A CLAY FARMER *.

P. S. If your land, by once passing over it with the roller, is not so fine as you could wish to have it, let a large harrow be fastened to the frame of the roller, which will pull up the remaining clots, and thereby give the roller a better chance for breaking of them the second time going over. Four able horses are equal to this work.

* We are much obliged to our correspondent, who here styles himself the *Clay Farmer*, for this his sensible, though brief, letter ; which has led us into a subject we have for some time wished to come properly in our way. The account of this instrument is so judiciously, though so concisely given, that we cannot believe the *Clay Farmer* has confined his useful speculations to this subject only ; and whenever he will favour us with the result of his observations on any other, we shall give it a thankful acceptance. A. O. H.

Additional Remarks relative to the Uses and Advantages of the Spiky Roller.

THERE is scarcely any late mechanical improvement of agriculture, which promises to be of greater utility than the *spiky roller*, whenever its use shall become general. It merits, therefore, that we should pay the utmost attention to it in this work, and by every means contribute to render its structure and uses extensively known and understood. We see with pleasure, by the above letter of our kind correspondent, the *Clay Farmer*, that it has
got

got some footing in Nottinghamshire in his neighbourhood; and, I presume, from the account Mr. Randal gives, in his Semi-virgilian husbandry, of his introduction of it into his own practice in Yorkshire, that it must have taken place among the judicious there. But it is far from being commonly used or known; and, consequently, the rendering more public every thing which tends to a just practical notion of it, must of course be serviceable. As, therefore, Mr. Randal, in the work we have just mentioned, gives a very particular account of the occasion and method of his first using it, and also of the advantages which resulted to him from his trial of it, we shall insert them here; as nothing tends more to a right comprehension and conviction, in matters of this kind, than a just relation of facts. And, in doing this, we shall supply what the brevity of the *Clay Farmer's* letter has not admitted; that is, a more explicit detail of the occasions and manner of its use. We shall, likewise, for the same reason, subjoin some other general remarks on the application of this instrument, to several very material purposes, which will be the better understood from having gone over what Mr. Randal says in his account, which is as follows:

“ I think it was in the spring 1752, when I had fifty
 “ acres of ground, designed to be sowed with barley, at
 “ one particular farm; but the weather had been so unfavourable, and the spring so extremely dry, that there
 “ was no such thing as preparing the ground for the reception of the seed: and this was the case with the
 “ whole country, in these parts of *England*. On looking
 “ one morning, at a barley roller, that lay just before
 “ me, I recollected that Mr. *Ellis*, in one of his eight
 “ volumes of *Husbandry*, made mention of a spiky roller,
 “ and referred the reader to another volume for its plate
 “ and description, which were no where to be found. I
 “ immediately sent for some workmen, and produced this
 “ useful instrument against the next morning, as the season
 “ was far spent, and much ground was to be sowed, in
 “ several farms, with this grain.

“ On this morning, a neighbouring substantial farmer,
“ passed by us, with half the country for clotters, as we
“ were going to put the horses to the roller, as he had
“ no longer patience to wait for rains, to reduce the
“ rough state of his ground, designed for barley seed : he
“ gazed at the roller, smiled, and went his way, with
“ his troop. They, after clotting two acres, all return-
“ ed the same way at night ; their master rolled his eyes
“ all over a field of about twenty acres, saw it perfectly
“ fine, (as the roller came back upon the same ground
“ it went down) and, after a pause, said, that was a
“ good hedgehog, for doing ten times more in one day
“ than all his troop together, and ten times finer than
“ a thousand clotters could do, in the same time. This
“ was the first time this farmer could be brought to say
“ a civil thing of any useful instrument, though com-
“ mon sense would pronounce the utility of this on his first
“ seeing it ; but the truth is, nothing but such glaring
“ effects can ever convince these people, as they have
“ the great art of despising what they do not understand,
“ or have not had in practice for ten centuries.

“ While the same man was going over the other ground
“ that stood in equal need of the roller, the ploughs were
“ set on to turn up the ground he had rolled ; and, when
“ all was thus ploughed, the roller went again over the
“ whole, to crush the clots thus turned up, and made all
“ as fine as before, by going twice in a place : then they
“ ploughed for a seed furrow, sowed the seed in the usual
“ way, and harrowed it in ; then the roller, with a thorn
“ bush fastened behind, went over again, once in a place,
“ and left all exceeding fine, which even would not have
“ disgraced a gardener in his manner of preparing the
“ ground for the garden culture in general.

“ The consequence of this lucky hit was, that, before
“ the country could get their seed into the ground, my
“ barley was fairly up, went forwards, and did extremely
“ well ; while, in general, my neighbour's barley made
“ but a sorry appearance, arising from the rough state of
“ the

“ the ground, which they could not bring into that fine
“ order this grain requires, notwithstanding all their toil
“ and expence. This atchievement of the spiky roller,
“ established its reputation among the neighbouring far-
“ mers ; but still they could not prevail on themselves to
“ be at the expence, which indeed was not small, in hav-
“ ing one made for their own use. The result of all was,
“ that I had other rollers made for the ground in other
“ parts belonging to me, only they were made heavier,
“ and both longer and larger, the better to suit the soils
“ that were much stiffer.

“ From this time we never sowed any seed in the com-
“ mon form, but the spiky roller, and thorn-bush at its
“ tail, followed the harrows ; as it effectually buried the
“ seed, and left the ground in a fine state. It may easily
“ be conceived, that this operation is of consequence to
“ vegetation ; for the fine mould, being thus swept into
“ the holes, made by the irons, and where the seed was
“ buried, must needs greatly promote their growing soon,
“ and nourish them well above ground ; as it is well
“ known, the finer the mould is, where the seed is depo-
“ sited, there vegetables are pushed on to their destined
“ maturity, if all other requisites concur. And upon this
“ principle it is, that if the corn in the spring is rolled
“ once in a place in like manner, the owner will be far
“ from having any cause to complain of the practice,
“ provided the weather, and state of the ground, will or
“ ought to bear the tread of the horses, and weight of
“ the spiky roller.

“ I am very sensible this will appear strange to many
“ persons, as it looks like sending a herd of rapacious
“ wolves to nourish a flock of tender lambs, or tearing,
“ bruising, and throwing all the corn up from their very
“ roots, and bringing on a general desolation over all the
“ ground. This is like *Sisyphus* in *Homer* ; we crop the
“ ground with much sweating and tugging, and then
“ suffer all to be destroyed again, by this ponderous,
“ grinning creature. But it may not, perhaps, be ill ex-
“ pressed,

“ pressed, when we say, that, in order to come at the
 “ truth of things in farming, we must, according to the
 “ *Greek epigram, ascend downward, and descend upward:*
 “ the most triumphant success, in the true bias of nature,
 “ in establishing agriculture, rises safely and surely on the
 “ foundations laid by bold experiments, that seem to con-
 “ tradict superficial reason.

“ Let us now consider the effect of this terrible desola-
 “ tor, as it goes over the young corn. If we consider
 “ the system of irons on the roller, they must leave some
 “ of the corn untouched by them; and then this is only
 “ rolling the corn in the common way, as it is only
 “ squeezed by the roller, and not bruised by the irons:
 “ so far there is no harm done. There must be corn,
 “ you will say, that is crushed and bruised, if not quite
 “ destroyed, by the violence of the irons. But supposing
 “ the corn lost, wherever the irons pitch, which is very
 “ far from being the case, yet the untouched corn will
 “ be so improved, by this shattering and loosening of the
 “ soil about their roots, and scraping of the mould by the
 “ thorn-bush, and shaking and tearing the tender blade,
 “ that the owner will judge for himself, whether the *Greek*
 “ epigram ought to have a place among the paradoxes in
 “ agriculture. However, it can do no gentleman much
 “ harm to let the roller go down in one place, and up
 “ again in another, and give over: and this single trial
 “ is all that the author pleads for, and that the weather
 “ and state of the ground be such, as will safely admit of
 “ the experiment.

“ The use of the roller, in making the fallows, and
 “ preparing the ground to a requisite degree of fineness,
 “ in the *old, new*, and what this treatise calls the *semi-*
 “ *virgilian husbandry*, is, by this time, pretty evident to
 “ the reader, and needs no more instances, where such
 “ perfection is desired.

“ We come now to speak of its use on grass land,
 “ where the sward is worn out by age, spoiled by moss,
 “ or a bad sort of grass; or defective, in any shape, from
 “ some

“ some cause or other, and yet it is very dangerous to
“ plough it up, and lay it down better, on account of its
“ situation, or it is not convenient, perhaps, for other
“ reasons, to disturb it with the plough: whatever the
“ case is, the owner, undoubtedly, would be exceeding
“ glad to have a better burden of grass on the ground,
“ for the maintenance of his live stock, or for the plea-
“ sure of seeing his ground, about his house, put on a
“ better appearance.

“ Here, then, there must be some compost prepared;
“ that is, a mixture of dunghill, fods, ashes, lime, mould,
“ soap-ashes, and such like ingredients, or as many of
“ them as can be conveniently procured, laid up in a
“ heap, in this manner: A stratum of mould, about half
“ a foot deep, then dung, then fods, then soap-ashes,
“ then common ashes, then lime, then dung; and to
“ cover all with mould about half a foot deep. When
“ these have laid some time, that the dung may commu-
“ nicate its juices to the strata beneath, the heap may be
“ thrown down with spades, so as, in the operation, these
“ ingredients being mixed together, the first stratum of
“ half a foot of the new heap may be composed of all the
“ ingredients; and so, in like manner, all the rest of the
“ strata, till the new heap is compleated: and after these
“ have laid some time, they will be very mellow, and fit
“ for use the *Michaelmas* after the winter, when the first
“ heap was formed.

“ We must now suppose the close, whose swarth is to
“ be improved, to have been laid down even, and not in
“ ridges; and that between *Michaelmas* and *Martinmas*,
“ the sooner after the former the better, the ground is to
“ be so moist, as to admit the irons of the spiky roller,
“ but not the horses feet; that is, the irons will penetrate
“ three inches, or thereabouts, and the horses feet make
“ little or no impressions. Here, then, the roller must
“ go up and down, till the swarth and ground are pretty
“ well broken up: this being done, the seeds of clover,
“ trefoil, and rye-grass, or any other mixt with them,

“ must be sown, in the usual way and quantity : then the
“ compost must be spread over the seed, so as to cover
“ them, and a *common barley roller*, with a thorn-bush
“ fastened to it, must follow, and the ground shut up,
“ lest cattle should do harm, by treading the ground.
“ A gentleman making this experiment, will have great
“ cause to be pleased with what he had done, and will
“ also see the necessity of laying down his ground as even
“ as possible for the future, that he may increase the bur-
“ den of his grass, whenever it falls short of a proper
“ quantity or quality.”

Mr. Randal has added a plate of the spiky roller to this account of it, but has omitted the wheels, which appear very necessary for bringing it to, and carrying it from its destined place of operation. The wheels are indeed absolutely wanted, for bearing it off the ground when it is not intended to penetrate ; and are therefore an essential improvement of Mr. Randal's roller. We have omitted to give any plate of the roller here ; because we apprehend the *Clay Farmer's* description of it in his letter, notwithstanding his modesty in saying, he shall only give some faint idea of it, is so full and clear, that we cannot doubt but that any able workman may easily make such a roller, as all the due proportions are given for every essential part of it.

Besides the purposes already mentioned, this roller must undoubtedly be of use in laying, originally, down lawns, or large pieces of grass required to be level. Mr. Randal only mentions the restoring such when depraved : but certainly this instrument must be extremely effectual in the case of all stiff lands, for the producing a good face in the first forming fine pieces of grass. The manner of doing this, in such cases, is too obvious to persons qualified for executing such work, to require any explanation : as the instrument may be used concurrently with any of the common methods of manuring and sowing grass seeds, as well as with Mr. Randal's compost, &c. they being no ways particularly necessary to the effects of the roller, though it may greatly aid them.

This

This roller may likewise be very useful *in preparing clay for the making canals or pieces of water*. For where, as sometimes happens, the clay grows dry, and will not admit of being duly tampered for use without great pains in breaking it, a very large quantity may very soon be reduced to the requisite fineness, by spreading it on hard ground in a due thickness, and passing this roller a few times over it. In very great works, much trouble and labour may be sometimes saved, by this means, where such a roller is at hand; and the clay prepared in a manner that will answer the purpose much more effectually.

It is certainly an instrument, which no farm, where the land is stiff, or in the least liable to clot, should want. For besides the constant advantage of saving labour, and bringing land to a better condition for any kind of sowing than the plough and harrow with any assistance of the work of hands can make it, in unfavourable seasons and under such circumstances as Mr. Randal has mentioned in the above quotation, the loss of the whole crop by an otherwise unavoidable delay beyond the seed-time, may be with certainty prevented. We hope, by propagating the knowledge of this important invention, to be the means of doing the public a material service; and, if any, who may be disposed to avail themselves of it, shall meet with difficulties, we shall readily afford a place to any letters or queries, which may conduce to procure the information that may be wanting to remove them.

NUMBER LXVI.

A Letter respecting the making Pot-ashes in Great-Britain.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

I Some time ago saw a paragraph in one of the newspapers, mentioning that the Society of arts and sciences had given thanks to a gentleman for furnishing them with

a recipe for making pot-ashes profitably, in small quantities, in our American colonies, which had been carried into practice with great success. It was to this purpose I think ; though I do not perfectly remember the words.

Now, Sir, I live in a part of the country where there is a great deal of wood burnt, and where the ashes are either sold for a trifle, or laid on the ground for manure ; and where, at least part of the year, there is a number of spare hands, that could afford, and would I believe be willing, to do any work at a very easy rate. I should be glad, therefore, to know, whether in such case this commodity, or whatever you call it, might not be made with profit here *. A little return of money, and the employment of the women, and the children too, that are able to do slight work, would be a great benefit in such a corner of the country as ours ; and help the people to bring up their children, and live much better : and I do not see how the public would be any way hurt by such a thing, if it were done. The ashes I suppose would be still useful as manure : as I have some knowledge from experience, that wood-ashes, when they have been used for making a lye, will answer for such purpose. I suppose as the recipe, this gentleman has given, is for making pot-ashes in smaller quantities, the vessels and tools that are wanted, would not be very expensive ; and that a person or two in any village, who could spare a little money, might begin the work, and buy the ashes at a small price of the rest of the people ; and where there are large families, such as in the houses of noblemen and gentlemen of great fortune, they could hardly fail of a supply, to make it answer in some degree.

If you think this a matter likely to be brought to bear, and that it is a proper one for your *Museum*, you will, I

* We are obliged to this gentleman for imparting his notion of this matter to us ; and we will endeavour to procure him all the satisfaction, as to the point he desires, which may be in our power. The facts he states are undoubtedly true ; and his conclusions seem just. R.

hope, afford it a place; and if the same gentleman, who gave the Society the process for the colonies, or any other, would publish it in your work, with any further information and instructions, that would suit it to our own country, they might possibly do more good than they may be at first aware of.

Your compliance with my request, if proper, will much oblige,

GENTLEMEN,

Kent,
Nov. 26, 1765.

Your very humble servant,
T. P.

NUMBER LXVII.

Observations on the Value of Manors and Estates let on long Leases determinable on Lives; demonstrating some material Errors in the Rates, according to which they are at present sold. In a Letter to A. B. communicated to the Editors.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

THE contents of the inclosed letter from T. V. to me, appearing very interesting to many gentlemen, who may have occasion to make purchases, I deemed it so far of a public nature, as to come properly within the compass of your plan in the *Museum Rusticum*. Calculations are easily made by persons qualified to undertake them, who are not rare; but the obtaining such a collection of relative facts, stated with accuracy and certainty, as are necessary to be the ground or subject of them in such matter as this letter concerns, is seldom to be had. I think, therefore, the inserting it may be useful, and consequently agreeable to many of your readers, whom, I conceive, for the most part, to be gentlemen who have concerns in
land

land estates. If you are of the same opinion, it is at your service to be published by you at your own time *.

I am, GENTLEMEN,

Your humble servant,

A. B.

S I R,

I Have received your letter, inclosing a particular of an estate offered to sale to you, concerning which you desire my opinion.

As the greatest part of this estate is let on leases for ninety-nine years, determinable upon lives, I do not think it an eligible purchase; unless you choose a large *extent of land*, producing a *very small interest* for your money.

In the western parts of Cornwall, where lands of inheritance, in possession, sell at thirty years purchase; reversions after three lives sell only at five years. In this county such reversions sell at six and seven years purchase, though lands of inheritance, in possession, sell only from twenty to four-and-twenty. One of these valuations must certainly be wrong.

The method I have taken, to arrive at some degree of certainty in this matter, is as follows. There is a large estate in this county; consisting of eleven manors, let in small parcels, on leases for ninety-nine years, determinable upon lives, with which estate I have had some concerns.

Very exact accounts have been kept of the profits of this estate, arising by fines, paid on renewals, for fifty years last past.

* We are obliged to Mr. A. B. for his communication of T. V.'s letter. We think it very deserving of a place in our *Museum*, as we have reason to believe it comes from a hand, where we may deem the authority for the facts, on which the calculation is founded, unexceptionable. Every material consideration, which respects land-estates, falls properly within the comprehension of our design; and we shall assign a place to any thing of this kind, that we may be favoured with at any time. E.

I went

I went as far back as September 1724; and selected such tenements as were then full stated; that is, had three lives subsisting thereon; and rated them at five years purchase. I also added together all the fines paid for renewals, from September 1724, to September 1764, being forty years: and to the sum total I added such sums as would have been paid, as fines, for filling up the lives on such of those tenements as had not three lives thereon, in September 1764, in case the lives had been filled up: and the whole amount of all the fines was no more than after the rate of one pound seventeen shillings and ten pence *per cent. per annum*, upon the value of those tenements, computed at five years purchase.

As the foregoing computation is not made upon uncertain guesses, or arbitrary suppositions, but upon plain facts; and as there are no peculiar circumstances attending the estate, upon which the computation is made, we may, I think, lay it down as a general rule, that whoever purchases manors, let on leases for ninety-nine years, determinable upon lives, even at five years purchase, for such tenements as are full stated, and in the same proportion for those that have only two lives and one life subsisting thereon, will not make two pounds *per cent.* of his money.

Many gentlemen, owners of estates of this sort, observing what small incomes they produced, have come to a resolution not to fill up any of the lives as they drop, but to suffer the estates to fall into hand. But this has not answered their expectations. For the leaseholders, when they have no expectation of renewing, work out the heart of the land, and suffer every thing to run to ruin for want of repairs; so that the tenements come into the lord's hands, in a most impoverished and ruined condition.

If the foregoing observations can be of any use to you, I shall be very much pleased.

Ashburton,
Dec. 1, 1765.

I am your's, &c.
T. V.

NUMBER LXVIII.

Observations on a Premium offered by the Society for the Encouragement of Arts, &c. for a Machine to slice Turneps for feeding Cattle.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

I Do not know a more effectual way of rendering your work useful to the public, nor perhaps agreeable to your readers, than by giving early notice of the new premiums relative to agriculture, or the æconomical arts, which may be resolved on in the London Society; and explaining or illustrating the reasons of their being offered, or the means by which the respective matters proposed may be most easily or best effected.

In this view, according to the promise I made you, in the letter published in your last number, containing general observations on agriculture, and the means of promoting it, I now send you an account of a premium to be offered for a machine for cutting turneps.

The purport of the advertisement agreed to at one of the last meetings is this: "That for the best cheap machine, for slicing turneps, for the feeding of sheep and horned cattle, with greater dispatch than by any method now in use, twenty pounds will be given."

It may, at first sight, appear to many an odd object of the Society's regard. As the reasons may not readily occur to persons who are unacquainted with the feeding sheep or horned cattle with this root, why slicing them at all for this purpose is necessary; or why that office cannot be performed by the knife and hand, in a sufficiently quick and commodious manner. To set the matter, therefore, in a just light, it may be proper to resolve both these doubts, and afterwards to subjoin some general remarks on the utility and advantages of such a machine.

The

The circumstances on which the necessity or expedience of slicing turneps is founded, are these: That with respect to horned cattle they are frequently choaked by eating whole turneps;—that with respect to sheep they make a great waste of them, by scooping out the middle, and leaving a great part with the rind or skin. Against this it is objected by some, that the accident of choaking does not happen so often as to counterbalance the trouble of slicing; and therefore that no advantage accrues from such a practice. But this is said by those only who have not sufficient opportunity of making a just observation, or are prejudiced against all methods but those which happen to be followed by themselves; for those who have the greatest experience have adopted it.

Mr. John-Wynne Baker, in his report to the Dublin Society, republished in your *Museum* of last month, expressly says, p. 275. No. 52. that slicing the turneps is *necessary*: he does not even content himself with using the word *expedient*. In the Society, during the debate on this matter, it was also mentioned, on the authority of an ingenious foreigner, that, in the province of Corinthia, in the empress-queen's dominions, where very great quantities of turneps are cultivated and applied to the feeding cattle, they are always sliced; and that, moreover, this operation was performed by a rude machine, very correspondent to the idea of the gentleman who proposed this matter to the Society, as he explained himself. There can be no room to doubt, consequently, but that the slicing the turneps, previously to their being given to beasts, is a right practice: though it would be a sufficient reason to prove the utility of this machine, to shew it is a practice at all. For whatever of this kind is frequently done, whether through the effects of prejudice or judgment, had better be done by cheap and easy methods, than by such as are more expensive and laborious.

The next question, therefore, is, why the slicing turneps cannot be performed as well, or at least sufficiently well for the purpose, by the knife and hand only, as is

at present practised here. This will be easily answered, by asserting, what may be established by recurring to facts, that a very considerable proportion of labour will be saved, and that the calamitous accident of cutting the hands, to which they, who are employed in this work, are greatly subject, will be prevented.

To illustrate the consideration of the proportion of labour, that may be saved, I will again have recourse to the part of Mr. John Wynne Baker's report before quoted. He there says, that in consuming nine hundred weight of turneps every day, as food for his cattle, he had occasion to employ all his hands, an hour every night, from Sunday to Saturday, and two hours every Saturday night, after they came from work. Now he asserts, likewise, that a bullock can eat two hundred and sixteen pounds weight every day. The quantity he used was only equal, consequently, to the portion of five bullocks, supposing them full fed. But if the quantity of turneps he used had been equal to the portion of forty or fifty horned cattle, joined to an equivalent number of sheep, as may be the case of many others, what number of hands would he not have wanted? and where must he have had them, even on extraordinary occasions? This may, nevertheless, be the case of many, at those times where the feeding with turneps is most requisite. For in seasons, when fodder fails, and becomes very dear, it is sometimes unavoidable for farmers or graziers to dispose, on any terms, with a great part of their live stock, or have recourse, if in their power, to the effectual expedient of feeding them on turneps.

The least reflexion on these facts, is sufficient to evince how great a proportion of labour may be saved by a proper machine for slicing turneps. The inconvenience of the sheers being subject to cut their hands, particularly where the turneps are not large, Mr. Baker mentions also, in the same part of the report, in a manner which sufficiently intimates the additional advantage of such a machine, in preventing those accidents. These are certainly sufficient arguments, to prove the importance of such

such a machine, to those who feed cattle with turneps at present.

But besides the assistance given to persons, who are now disposed to cultivate this article, by the furnishing a more advantageous method of using the turneps, by means of such a machine, it may remove the objection which others have to the culture of them for this purpose, from the hazard of cattle being choaked; the apprehension of which has, to my knowledge, deterred several from persevering in it, on account of their having suffered some material loss by such accidents. If an easy method of slicing the turneps be found out, this objection to the culture of them is of course removed, which is a matter of moment to the public. For the use of turneps, cabbages, carrots, &c. to supply the place of hay, straw, or grass, is of much more consequence than it may at first appear to be.

To comprehend this properly, let us look back, and recollect what were the consequences whenever rigorous seasons happened, before these substitutes for dry fodder were introduced. We may too well remember the deplorable effects of the long frost, in the year 1739-40. Not only a very great number of persons either lost their horned cattle and sheep, or were obliged to sell them at any rate; but even, from the almost total consumption of hay and straw, a great part of which was given to the sheep and horned cattle, merely to keep them alive, the poorer class of people lost their horses also.

The consequences of this destruction of the breeding-stock was felt for many years after, and perhaps is not without some effect on the present market. The same mischief, in a less degree, was felt on every unfavourable season, till the art of saving the consumption of dry fodder got the footing it now has. The benefit of the further prevalence of this method is, therefore, very evident, as it necessarily prevents that accidental scarcity of butchers meat, and consequently of all other provisions; not to mention tallow for candles, and skins for leather, that are equally affected by such scarcity, which are very inconvenient

convenient to the rich, and ruinous to the poor; and tend of course to injure our manufactures and foreign trade, by raising the price of labour.

A machine, therefore, intended to assist those who pursue a practice so interesting to the public; to enable them to go more largely into it, and to encourage others, by the removal of a difficulty which deters them from it, to take it up, is certainly very well worthy the notice of the public, and the attention the Society has shewn to it. The practicability of constructing such a machine as will perform this office, and will not be cumbersome in weight, incommodious in bulk, or dear in price, is the next consideration. But of this there certainly can be little doubt. The cutting of straw and hay is a more difficult operation, from their greater tenacity, than turneps, and yet a machine simple enough, known by the name of the *cutting-box*, (of which there is a description in your *Museum*, Vol. V. No. 25. p. 208.) has been invented, that very well answers the end. Machines of the same nature, but more complex, have been constructed for cutting tobacco; as also woollen rags for the flock for paper-hangings. The latter of these has been executed with much ingenuity, and cuts the rags with great dispatch and exactness into extreme small parts. The machine of this kind, which I saw, was added to a diamond-cutters mill, and moved with the same power. I have seen another machine contrived, very ingeniously, for the mincing flesh for sausages by the same person, who deservedly had a bounty from the London society, for inventing and making a machine that planed the broadest cast-iron plates, with the same effect as a common carpenter's plane, executes on boards. These instances of machines which perform operations of a similar kind, but much more difficult, clearly shew the practicability of constructing one for the slicing turneps. In machines for the cutting tobacco or rags, or mincing flesh, where the division is to be made into small parts with accuracy, and the texture unfavourable to the force, a more complex mechanism, wrought by the hands

hands of expert workmen, is indeed required : and consequently such must be expensive, and not easily to be procured every where. But in the case of cutting turneps, where the slices are not required to be thin, and the inequality of them is of no consequence, a very simple machine, put together without more exactness of work than brings it within the ability of a common carpenter, may be very well made to answer the end, and it is such a machine only, which the Society intend : the gentleman who proposed the matter to them, having introduced the word *cheap* in the advertisement on that very account : since no machine of this kind can be cheap, without being simple. The giving a clear intimation, that cheapness, and consequently simplicity, are requisite conditions to be observed for obtaining the premium, was very necessary ; as it is no rare thing to see produced before the Society very complicate constructions for minute purposes : but, besides the objections to expence, such inventions never answer in practice. For, whenever we see the same elaborate mechanism in a cork-screw, we should expect to find in a crane, we may be sure the result of producing it to the public will be, that they will use it the first month, and perhaps divert themselves with it as a novelty the second ; but it will be rejected the third, and in all probability forgot in the fourth.

I have said more on this subject than I intended, partly by way of apology for saying any thing at all. For I was apprehensive, from what I saw happen in the Society, while it was under consideration there, that they who are unacquainted with the particulars relating to it, might deem it trivial and insignificant, till they were better informed. But I presume, as it is worthy the notice of the Society, and I doubt not of the public, it may be worthy a place in your *Museum* ; which however I leave intirely to your discretion. The next time you hear from me, it shall be on a matter, the importance of which cannot admit even of the least doubt. In the mean time I remain,

GENTLEMEN,

London,

Your's,

Dec. 18, 1765.

AGRICOLA.
NUM-

NUMBER LXIX.

Letter to the Editors, containing some general Remarks on the Contents of the Museum Rusticum; with an Answer to them from the Editors.

To the Editors of the MUSEUM RUSTICUM.

GENTLEMEN,

BEING in company with a party of friends, who have taken in your *Museum* for some time, and the conversation happening to turn upon that performance, it was universally agreed, that your design was highly laudable, as the subjects you had chose to treat of were of the most extensive utility: but we were all at the same time unanimous in this, that the actual execution of your plan was confined within a much narrower compass than what the title-page gave us room to expect. Agriculture, and the things immediately relating to it, (on which you have furnished the public with several very useful and entertaining essays) has been your general theme; which, though a subject of a very copious nature, and deserving a most particular attention and regard, as being of the greatest emolument to society, yet ought not to supersede the obligation you are under of acting up to your proposals, by giving us some strictures on the other separate articles of commerce, arts, and manufactures, which were mentioned as part of your design, but have had little or no share in any of the *Museums*, we have yet had the pleasure of perusing.

We have been informed, by persons learned in the Roman language, that your English title carries with it a much wider meaning than your Latin one, which answers pretty nearly to the extent of your performance. What might be your reason for hanging out this literary sign,

or

or why a less comprehensive scheme should be promised in it, we presume not to determine: but it affects not our cause, who can with reason only be supposed to build our expectations on what was proposed to us in our own native tongue: and it is our opinion, upon comparing matters, that such a curtailing of the proposals offered to the English reader, of which sort we apprehend are the generality of your customers, is an infringement of his right: for though we are far from thinking, that what is published monthly is inadequate to the valuable consideration, yet where more is promised, more is certainly due.—Besides, that the completion of your design would serve to prevent the tediousness of some particular, though not very important topics, make the work of more general benefit, and interest a greater number in its encouragement and support. We hope you will excuse the freedom; and are,

GENTLEMEN,

Northumberland,

Your friends and well-wishers,

Oct. 21, 1765.

J. T. &c. &c. &c.

Remarks on the Conduct of this Work, in Answer to those in the foregoing Letter.

THE editors do not shelter themselves from any censure, under the excuse that the Latin title *Museum Rusticum et Commerciale*, does not comprehend whatever may be expressed by the more explanatory English title, which enumerates agriculture, commerce, arts, and manufactures. They originally meant, and do still mean, that every material information, relative to improvements in the above subjects, which are either communicated to, or can be procured by them, should have a place in this work.

After admitting this, they are not conscious, nevertheless, of any breach of their engagement to the public, in

the manner the ingenious writer of the above letter seems to charge them with. It is true, that the greatest part of what they have hitherto published, regards only agriculture : but when the reasons why that has happened are considered, they make no doubt their conduct will have a full acquittal from his candour. In the first place, a taste for agriculture as a study, or an attention to it as a practice, are by far more general than those for any other subject that comes within the comprehension of the title they have given.

It should be next considered, that agriculture, though a single term, yet includes a great number of æconomical arts. It respects the choice and preparation of ground for the different productions of every thing afforded by it ;—all the operations necessary for obtaining the produce, as well trees as herbs ;—the preservation and treatment of such produce, in order to bring it to market, or consume it with profit ;—the apt construction of instruments for all these purposes ;—the proper application of the produce of land to the feeding and fattening various kinds of beasts, or cattle ;—the propagation and preservation of such cattle from want of food, from inclemency of weather, and from diseases ; the several manners of fencing, and draining lands ;—the general improvement of soil, by a great variety of means ;—the introduction of new articles of culture, that yield superior advantage to the old ; — and the improvement of the methods now pursued for all these various purposes. If it be wondered at, therefore, that so extensive a field of invention, particularly cultivated at present, in consequence of a reigning taste, especially as few discoveries relating to such subjects are concealed, should afford greater supply of matter for such a work than other arts relating to manufactures and commerce, where the persons who make them have in general the strongest reason for keeping them secret.

Our work has not, however, been wholly confined to agriculture, even hitherto ; and we assure this correspondent, as well as all our others, that we have taken effectual

tual measures for procuring discussions of a greater variety of topics, exclusive still of all that are trivial and of little utility, in the future contents of this work. And particularly we shall endeavour to follow the tracks which the Society of Arts shall point out by their premiums, or other notices, in order to render, by ample information and explanation of every subject, their labours more efficacious for the public service. We hope, as this design perfectly corresponds with the views and intention of the Society, we shall have the countenance and favour of every zealous member, as well as of those gentlemen, who, by their communications to the Society, mean to promote the same public-spirited end. And as the Society do not at present in general publish such pieces as are transmitted to them; and, when they have thought fit to do it, have had no opportunity but that of inserting them in magazines, or news-papers, where they are not likely to be seen, at the time of their publication, by those to whom they would be most serviceable, and are buried for the future in a chaos of other foreign matter, we therefore repeat our offers of giving a place in this work to every thing that has had the sanction of a favourable reception from the Society; and will either publish it as sent there, or together, with such additional observations or explanations, as the respective authors or communicators may think will render them most conducive to the public benefit.



INDEX to VOLUME V.

A

A FRICAN millet, culture and amazing produce of	74
Agriculture, reflections on the first section of Dr. Home's prin- ciples of	181
Observations on the importance to Great-Britain, and the means of improvement of	241
Neighbourhood or county societies for the improvement of	248
Alder, Hall's method of cultivating	283
Apiaries, proposal for the increase of in Ireland	110
Apple-trees, method of curing luxuriant	68
Ash-tree, Hall's method of cultiva- ting	230
Ashes, pot	381
Turf, observations on	310
Aspen-tree	232

B

B ARLEY, drilled and broad-cast, comparative trial of	325
Produce per acre	328
Basso-relievo, in clay, premium for	95
In Portland stone	16.
In marble	100
Beach-tree, Hall's method of culti- vating	218
Bere, remarks on the culture of	68
Blue-ball-wheat, what	46
Boorcole, culture of	267
Bronzes, premiums for	99
Burnet, sown in broad-cast after two crops of corn	1
Experiments on sowing and trans- planting	4
Nature of that kind cultivated by Mr. Rocque	57
Observations on the various species of	61
Observations on the culture of	134, 189, 250, 281, 330
Sown on a poor sandy soil	157
Difference betwixt the species now cultivated in various parts of the kingdom	237

Burnet, different success of the cul- ture of	293
Answers to queries relative to	294

C

C ABBAGES, culture of	261
Produce per acre	264
Consumed by cattle and sheep	278
Turnep, culture of	257
Produce per acre	264
Consumed by cattle and sheep	278
Cameo, premium for	98
Carexes, a grass, observations on	61
Carrots, culture of, use in feeding and fattening cattle	22
Produce and effects of twenty-four acres of	34
Cattle, great, housing of	125
Curing of hovey, by eating clover	218
Chestnut tree, Hall's method of cul- tivating	229
Chimneys, easy method of building to prevent their smoaking	149
Clover, red, culture of	340
Produce per acre	340
Common wheat, experiments on	321
Cone-wheat, what	46
Cutting-box, proposed improvements of	208

D

D AIRY, reflections on the profit of	355
Drawings at the academy in St. Mar- tin's Lane, premiums for	90
From the duke of Richmond's gal- lery	16.
Of a human figure or figures	16.
----- after a print or drawing	91
Of human figures in groupes	16.
----- or heads after drawings or prints	16.
Of beasts or birds, by youths	16.
----- by girls	16.
Of fruit, flowers, &c. by youths	16.
----- by girls	16.
Of ornaments, by girls	92
Drawings	

I N D E X.

- | | | | |
|--|------------|--|--------------------|
| Drawings of ornaments, for weavers | 52 | Grassies, for arate culture of | 161 |
| ----- by youths | <i>ib.</i> | Stallagfleet's opinion relative to | |
| ----- for weavers | <i>ib.</i> | the best English | 173 |
| Of the best original pattern for weavers | <i>ib.</i> | Mr. Rocque's | 186 |
| Of any kind, by boys | 93 | Ground-ivy, fatal effects of, when eaten by horses | 71 |
| ----- by girls | <i>ib.</i> | | |
| Of a horse | <i>ib.</i> | H | |
| Of landscapes | <i>ib.</i> | HISTORICAL pictures in china | |
| Honorary | <i>ib.</i> | ra oscura, premiums for | 90 |
| Historical | 94 | Horse-bear, Hall's method of cultivating | 279 |
| E | | Horse-beans, observations on the sowing with rats | 309 |
| ELM-Trees, method of planting | 10 | Housing of great cattle | 125 |
| Hall's method of cultivating | 229 | I | |
| Engraving Landscapes, premiums for | 97 | INTAGLIO'S, premium for | 98 |
| History pieces | <i>ib.</i> | L | |
| Of a human figure | 98 | LARISH, Hall's method of cultivating | 237 |
| Estate, let on long leases determinable on lives, value of | 384 | Leases for long lives, observations on the value of estate, consisting of | 384 |
| Etchings by youths, premiums for | 95 | London-tree, Hall's method of cultivating | 233 |
| F | | Lucerne, Mr. Rocque's method of cleaning with harrows, demonstrated | 37 |
| FARM-House, improvement in covering of | 204 | Cautions about sowing and transplanting | 61 |
| Fir-tree, Hall's method of cultivating | 235 | Experiments in the culture of | 189, 281, 333, 335 |
| Fish-stock, premiums for | 102 | Comparative reflections on | 350, 359 |
| Method of cure | <i>ib.</i> | M | |
| Fisheries, premiums for | <i>ib.</i> | MANAGEMENT of Mr. Stott's common-field, according to Magr's advice | 195 |
| Fly in sheep, acknowledgement of the efficacy of a receipt, published in the Museum Rusticum, for the cure of | 240 | Manors, let out in long leases determinable on lives, value of | 384 |
| Fooder, proposal for increasing of, by suppressing a reigning evil | 200 | Manure, proposal for increasing the quantity of, by suppressing a reigning evil | 200 |
| Furze, uses of, and impropriety of, cultivating it in England | 213 | Plough, proposed improvement of | 363 |
| G | | Description of | 366 |
| GRAIN, advantages of ascertaining the mean weight of various kinds of | 151 | Maple, great, plantation of, recommended | 318 |
| Grass-grounds, winter management of | 154 | Hall's method of cultivating | 233 |
| Improvement of | 161 | Marble statue, premiums for | 100 |
| Grassies, account of several kind lately discovered | 13 | Basso rilievo's | <i>ib.</i> |
| Experiments relative to | 39 | Meadows, | |
| Different kinds of, with specimens of each | 42 | | |
| Observation on various species of | 61 | | |
| Means of propagating the separate culture of native | 67 | | |

I N D E X.

Meadows, winter management of	154
Medallion, premiums for	94
Medals	95
Metzotinto's, by young Men	97
----- by young women	<i>ib.</i>
Models in clay	95
Ornamentals in wax	<i>ib.</i>
----- by girls	96

O

O AK, Hall's method of cultivating	227
---	-----

P

P AINTING in enamel, premium for	99
Of sea-pieces	100
Peas, when injurious to sheep	277
Plane-tree, Hall's method of cultivating	231
Plough, five-cultured, description of	199
Proposed improvements of	363
Description of	366
Pot-herbs, premiums for	90
Pot-ash, letter respecting the production in England	381

Q

Q UERIES on laying down some particular land with grass	289
--	-----

R

R AG-WORT, observations on the growth and destruction of	117
Red-worm, description of	345
Experiments on	346
How prevented from destroying corn	350
Rooks fondness for	344
Re-closer, experiments on	340
Produce per acre	<i>ib.</i>
Reflections on some late letters to the editors	47
Remarks by the editors, on the conduct of the Museum Rusticum, in answer to a letter on that head	79, 392, 393
Roller, spiky. See Spiky-Roller.	

S

S AINTFOIN, observations on	61
Experiments in the culture of	185
Salow, Hall's method of cultivating	232
Scab in sheep, acknowledgement of the efficacy of a receipt published in the Museum Rusticum for the cure of	240
Seagrim, observations on the growth and destruction of	117
Sea-salt, qualities of, with respect to vegetation	159
Service-tree, Hall's method of cultivating	236
Smut in corn, means of preventing	368
Spiky-Roller, description of	377
Use and advantages of	374
Spring wheat, experiments on	321
Statues in marble, premiums for	100
Stock-fish, premiums for	102
Method of cure	<i>ib.</i>
Survey of counties, premium for	101
Sycamore, plantation of, recommended	318

T

T IMBER-Trees, essay on	225
Trefoil, native strawberry, experiments on	340
Turf-ashes, observations on	310
Turneps, culture of	257
Produce per acre	272
Quantity consumed by cattle	277
Benefit of harrowing a foul crop of	239
Produce of drilled and broad-cast compared	272
Accidents and distempers of	276
Account of a premium on a machine for slicing	386
Cabbage, culture of	257
Produce per acre	261
How useful in feeding sheep and cattle	277

V

V EGETATION, reflection on the first section of Dr. Home's principles of	181
---	-----

WALNUT-

I N D E X.

W

WALNUT-Tree, Hall's method
of cultivating 228
Weeds, list of the most remarkable 301
Wheat, cone or blue-ball, what 46
Improved way of producing good and
clean crops of 104
Account of prices of 137
Spring, experiments on 321
Common *ib.*

Wheat, drilled and broad-cast, com-
parative trial of 325
Produce per acre 328
Willow-tree, Hall's method of culti-
vating 231
Worm, red. See Red-worm

Y

YOUTH, intended for a farmer,
opinion relative to the education
of 82

E N D O F V O L. V.



